

# FLIGHT

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice and Progress of Aerial Locomotion and Transport.

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM.

No. 418. (No. 52, Vol. VIII.)

DECEMBER 28, 1916.

[Weekly, Price 1d.  
Post Free, 1½d.]

## Flight.

Editorial Office: 44, ST. MARTIN'S LANE, LONDON, W.C.

Telegrams: Truditur, Westrand, London. Telephone: Gerrard 1828.

Annual Subscription Rates, Post Free.

United Kingdom .. 6s. 6d. Abroad .. .. 11s. 6d.

### CONTENTS.

	PAGE
Editorial Comment:	
The Passing of 1916 .. .. .	1131
The British Air Services .. .. .	1131
New Aircraft Types .. .. .	1132
The Dirigible .. .. .	1132
Raids—Enemy and Allied .. .. .	1132
In Winter's Grip .. .. .	1133
The Roll of Honour .. .. .	1134
The Royal Aero Club .. .. .	1134
The Report of the Air Enquiry Committee .. .. .	1134
Loss of Air Supremacy .. .. .	1135
The Life of the Air Board .. .. .	1135
The British Air Services .. .. .	1137
The Royal Aero Club. Official Notices .. .. .	1138
International Aircraft Rigid Dirigible .. .. .	1139
Armchair Reflections. By the "Dreamer" .. .. .	1141
Answers to Correspondents .. .. .	1142
Airisms from the Four Winds .. .. .	1143
Final Report of the R.F.C. Enquiry Committee .. .. .	1145
Aviation in Parliament .. .. .	1147
Recent German Aeroplanes .. .. .	1148
Personals .. .. .	1149

Last year the word "Peace" was probably the one that was farthest away from our thoughts. Now it is in everyone's mind. Not that there appears to be even the remotest chance of a world-peace within any period of time to which a name can be given now, but the word has been uttered and in no uncertain manner. We know that the word and the manner are alike unacceptable at the moment, but the mere fact that it has been uttered and that we know at least some of the conditions that have prompted it, has led to the realisation that the war *must* end sometime, and to the hope that that end is now not far off.

### The British Air Services.

During the year both branches of the British air service have developed wonderfully, alike in material and in the numbers and efficiency of their *personnel*. There have been no changes in the higher commands of either Service, nor have there been any such dramatic "reorganisations" to chronicle as fell to be recorded at the end of 1915. The story of development has been one of steady improvement all round rather than of drastic change.

In Parliament and in the Press we have had a great deal of discussion of aerial policy generally, the necessity for which can only be regarded as a regrettable outcome of the lack of single-mindedness of the late Administration. A Committee of Enquiry early in the year was charged with the washing of a great deal of dirty linen that might better have been cleansed privately and without recourse to methods which could not have failed to afford satisfaction to the enemy and uneasiness among our Allies. Then the numberless questions and discussions which arose out of the "Wait and See" policy must have accentuated those feelings, which the ultimate appointment of an Air Board, with Lord Curzon as its President, could have done very little to allay. At the time of its appointment it was understood that this Board was to have executive functions. Later, it transpired that this was not the case, and at once the whole controversy about the air services was revived in an acute form. The subject was to have been one for a full-dress debate in the House, when the change of Govern-

## EDITORIAL COMMENT.



ET another year is about to pass into the realm of the things that have been, and we can truly say that it will pass with rather less of regret than we usually view the passing of the milestones of Time. It has been a year of stress and of much disappointment on the whole, though it has had the redeeming feature that its last month has seen the substitution of a live for a moribund administration of our national affairs. It has been a momentous year in many ways, as well in the development of aviation as in the affairs of the world generally. Of the former it is still impossible to speak in detail, since the considerations still obtain that have precluded detailed comment on aircraft progress for the past two years.

The Passing of 1916.

ment intervened, and, like other matters of public interest, it had to be shelved. To the intense satisfaction of all who have made the study of aerial policy their own, one of the first official announcements of the new Ministry was to the effect that we are to have a real Air Board with executive functions, and a Parliamentary Secretary to speak for it in the House. A Bill to give effect to the announcement is shortly to be introduced. Quite as satisfactory was the statement that the friction between the Air Board and the Admiralty, which militated against the usefulness of the former, has been smoothed away, and that now all are working to the common end. In this we see strong hope that the days of "Air Crises" are over for all time.

The past year has seen the election to Parliament of the first Member to be sent to Westminster on the issue of an aerial policy. Mr. Pemberton Billing had a great chance had he chosen to avail himself of it. Perhaps the best—as it is certainly the most charitable—comment that can be made is that he failed to see the Heaven-sent opportunity that was given him to make a real and lasting mark in public life.

## New Aircraft Types.

Now, as a year ago, it is impossible to speak except in the most general terms of the developments which have been brought about by experience gained during another twelve months of war. In the realm of the heavier-than-air machine the tendency has been to develop the large, fast battle-plane and the speedy scout. Power and speed in both types has increased greatly during the year, both on our own and the enemy's side. It has been a fight for greater efficiency on both sides, with the pendulum alternately swinging this way and that. It is satisfactory to be able to record that the end of the year sees our Army equipped with machines that are fully equal to, if not better than, the best the enemy can put into the air. We should be still more pleased if we were satisfied that our Flying Service has these "best" machines in sufficient numbers.

## The Dirigible.

Although it is undoubted that much has been learnt about the construction and use of airships during the year under review, it is not possible to say that the development of the lighter-than-air craft has shown the same advance as in the case of its heavier sister. We know that many improvements in construction have been effected, but so far as these affect the airship fleets of ourselves and our Allies, again nothing can be said for the most obvious of reasons. The enemy has busied himself on the building of much larger and greatly improved airships of the Zeppelin type, from which great things were hoped. His initial experiences with these super-Zeppelins have not been such as to encourage him to persist with the type in the purpose for which they were intended—the raiding of these shores—as we shall see when we come to review the narrative of the year's air raids. These experiences have probably taught the German air command that the game is not worth the candle. It would, however, be foolish to think that because the manner of dealing with the raiding airship has

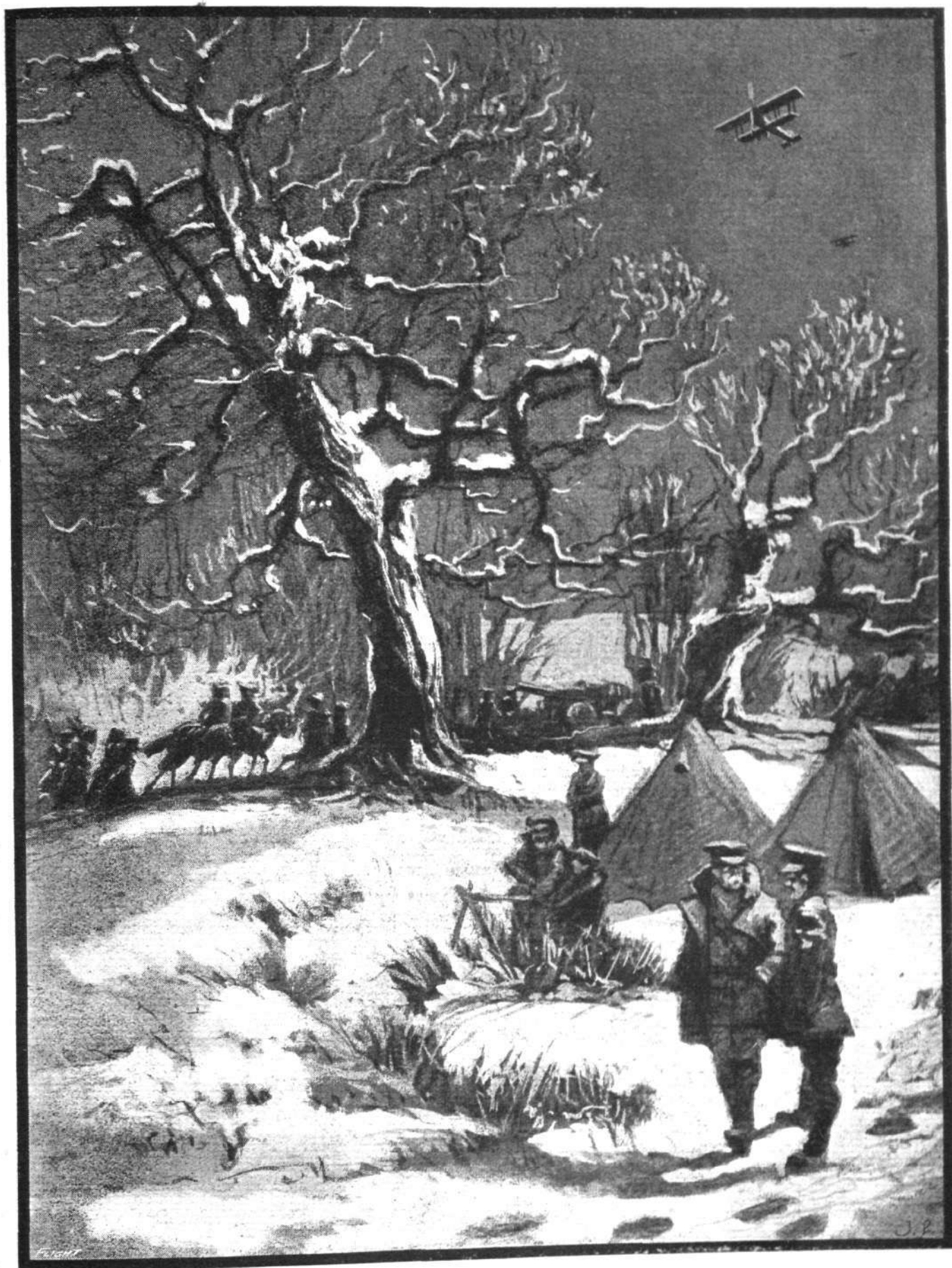
been discovered that the type is useless for purposes of war. On the contrary, it has shown itself to be an essential part of aerial equipment for war, and that notwithstanding the disasters that have overtaken many lighter-than-air craft engaged in warlike operations during the year. That an effective answer has been found to the airship when used to raid hostile territories does not of necessity demonstrate that it is a totally ineffective arm, but simply that its undoubtedly great capabilities can be better utilised in another and less risky direction. Over and above its potentialities for war, the dirigible, in the form to which belligerent experience will be found to have developed it, has a great commercial future before it. It will be well, therefore, if we do not allow our vision to be clouded by the happenings of the past twelve months, and that we should pay close attention to the future of the airship.

## Raids—Enemy and Allied.

During the year the enemy has again made a number of aerial raids on these shores, both by airship and aeroplane. So much have our defences been improved that we can almost regard the tale of enemy raids with something approaching satisfaction. Early in the year a raiding Zeppelin was brought down in the Thames Estuary, and every effort was made to salve it. A little later another similar craft was seen in the North Sea, partially submerged, by the crew of the British trawler "King Stephen." The crew of the wrecked airship begged to be taken off, but the master of the trawler, guided by known Hunnish methods, declined to take the risk involved and left them to their fate. There was a good deal of discussion relative to the conduct of the master, but he was held by most people to have acted quite properly in refusing to trust his vessel and her company to the faith of the armed airship crew. In September the first raid on London of the year took place, in which considerable damage was done, while Lieut. Robinson, of the R.F.C., brought down an airship at Cuffley, for which he was awarded the V.C. Another raid on the Metropolis took place a month later, and this time the enemy was still more unfortunate, as he lost two of his latest super-Zeppelins, which were brought down—one at Billericay and the other near the Essex coast. One consequence of this raid—a particularly unwelcome one to the enemy—is that the fullest details of construction of the latest Zeppelins are no longer a secret to our own services. One more attempt was made on London in October, resulting again in disaster to an enemy airship, which was brought down in flames at Potter's Bar.

In November a fleet of hostile airships raided the North-Eastern and Midland counties, again with disastrous results to the raiders. One enemy airship was brought down by gunfire and aeroplane attack off the coast of Durham; the other was destroyed nine miles off the Norfolk coast. Of this brace, one fell to the R.F.C. and one to the R.N.A.S. In addition to this large scale raid, during the same week a hostile aeroplane dropped six bombs in the West End of London shortly before noon, but without doing any material damage worth noting. The enemy pilot was brought down and captured by French machines near Dunkirk while on his return journey.





IN WINTER'S GRIP BEHIND THE LINES.—Our Army's eyes, ever watchful above, whatever the weather.

At the outset of the Roumanian campaign the enemy carried out many air raids against Bucharest, in which aerial "frightfulness" was seen at its worst. Not content with dropping the usual explosive and incendiary bombs and killing and maiming many of the civilian population, it is categorically stated that poisoned sweets and disease germs were showered on the Roumanian capital.

In respect of the enemy's Zeppelin losses during the year, it appears to be fairly well established that these amount to 39 in all, in addition to which other losses are said to have been incurred, but have not been sufficiently authenticated.

All the raiding by air has by no means been left to the enemy. On the contrary, a number of notable raids have been undertaken by the Allied air services with a considerable measure of success. Zeebrugge has been attacked by numbers of R.N.A.S. machines on several occasions, and a great deal of important damage done to the military works and the shipping in the harbour. Enemy munition works and blast furnaces have been successfully bombed by combined British and French squadrons, while in the Eastern theatre R.N.A.S. machines have done excellent work against Bulgarian harbours and communications.

The most notable flight of the year was that accomplished by Lieut. Marechal, a French pilot, who flew from Eastern France across Germany, dropping leaflets in Berlin, and landing by mistake in the Austrian lines in Poland after a flight of over 800 miles. Another notable raid was that made by two French airmen on Krupps' works at Essen, involving a flight of more than 500 miles, both machines returning safely. Later one of the Essen raiders, Capt. Beauchamp, flew from France into Italy, dropping bombs on Munich and crossing the Alps on his journey. Unfortunately this gallant officer met his death in December while flying at Verdun.

## The Roll of Honour.

Unfortunately the enormous increase in the Air Services has carried with it a correspondingly heavy toll of loss, though it is satisfactory to be able to temper the reflection with the knowledge that in proportion to the amount of flying done our casualties have been relatively lighter than in 1915. Even so, we have to mourn the loss of a very large number of

gallant pilots and observers who have laid down their lives in the great effort to free Europe of the German menace. In spite of the heavy losses there is no dearth of candidates to fill the depleted ranks. In fact, there are more applicants for admission to the Flying Services than ever.

Where so many gallant officers have sacrificed their lives on the altar of duty, it seems invidious to select from the roll of fallen any for special mention. A passing reference, however, may be made to Lord Lucas, whose death while flying in France was officially reported in November. An ex-Cabinet Minister, of over 40, Lord Lucas had previously served in the South African War, in which he lost a leg. In spite of this disability, when he went out of office on the formation of the late Coalition Government he immediately joined the R.F.C. and went to France. Two other notable personalities who were killed in England while engaged in an experimental flight, were Commander Osborne and Lieut.-Commander Ireland, two of the best of the R.N.A.S. pilots.

## The Royal Aero Club.

Again it falls to be recorded that although the Royal Aero Club has still had to hide its light under a bushel, so far as public activities are concerned, it has, nevertheless, accomplished a great deal of very useful work during the year.

The Flying Services Fund, which was founded in 1915 for the purpose of assisting the dependents of members of the Flying Services killed in action or disabled by wounds, has reached the substantial total of nearly £12,000. Although this may be regarded as passably satisfactory, in view of the great increase in the Services and the correspondingly heavy number of those needing relief, it is to be much hoped that during the coming year the industry and others interested in the aerial movement will come forward with even more generosity than in 1916. The total should be nearer £120,000 than the modest £12,000. As the year closes the Club is moving into new and more commodious quarters in Clifford Street, though these will not be available to the members until early in the new year. With this departure, the successful future of this ruling body in the Aeronautical World should be more than ever assured.

## The Report of the Air Enquiry Committee.

It is fitting that the close of the year and the appointment of a new Administration should be coincident with the issue of the final Report of the Committee of Enquiry into the command and administration of the R.F.C. The Committee's recommendations were published in last week's issue of "FLIGHT." As for the Report in its entirety, it is of too lengthy a character for even careful review at the moment. That, however, is scarcely a matter of moment, since the points of criticism have been covered in the main by the Committee itself in its Recommendations.

There are, nevertheless, one or two points of the Report to which reference may usefully be made. Leaving over for the moment the Committee's find-

ings on what may be described as general charges, and confining our attention to the specific, we find that the Committee is to some extent in agreement with the statement that pilots and observers have been sent to the Front before they were sufficiently trained. This, in the view of the Committee, was inevitable in the early stages of the war, and no blame attaches to the Command for the inevitable situation in which the R.F.C. found itself on the outbreak of war. Strenuous efforts have been made to cope with the difficulties, but even now training is to some extent hampered by the want of sufficient school machines and of instructors. The Committee favours the rapid development of special aerodromes for instruction of pilots and observers in air-fighting.



### The Committee and the R.A.F.

So far as concerns the allegations that undue preference was given to the R.A.F., and that there was grave delay in ordering engines from private firms while the Factory was getting out designs, the Committee finds that the alleged delay in ordering better engines occurred in respect of the 110 h.p. Clerget, the 110 h.p. Le Rhone, and the 200 h.p. Hispano-Suiza engines. All these engines are admittedly good, and all have now been ordered in considerable quantities. There was no undue delay in ordering the 110 h.p. Clerget engine. There was very considerable delay in the case of the 110 h.p. Le Rhone engine, and slight delay in the case of the 200 h.p. Hispano-Suiza. As to aeroplanes, they think there was no delay for which any blame can be attributed to the Royal Flying Corps. They do not believe that the delay in ordering the Le Rhone and the Hispano-Suiza engines was attributable to the fact that the directorate was trusting to the Royal Aircraft Factory to produce equivalent or better engines. As to whether any blame attaches to the directorate, the Committee think the delay in ordering the Le Rhone engine was too long, but they are satisfied that, within the limits of the engines actually available, no undue preference has been given to the Royal Aircraft Factory.

It was said that the feeling of the trade against the Royal Aircraft Factory was bitter, but as to this the Committee had no evidence from trade witnesses. Some of the witnesses went so far as to say that the Factory was a competitive manufacturer with private firms. This was so contrary to the fact that the Committee dismiss the suggestion as frivolous. The Factory has built no engine except experimentally, and has only constructed for use 77 aeroplanes, of which 50 were to assist a private maker in the fulfilment of an order.

It was alleged that the Royal Aircraft Factory had been a dis-service and not a service to the Royal Flying Corps. The first branch of this criticism amounts to the charge that the designs of the Factory, whether of aeroplanes or engines, have not been efficient. As to this they assert that the Factory has produced many designs which have done admittedly good service, but it must be judged by its principal achievement, the B.E. 2c aeroplane, combined with the 90 h.p. R.A.F. engine. Much of the criticism of this machine has been ill-founded. All the three airships which were brought down in flames on the nights of September 2nd, September 23rd and October 1st last were brought down by pilots flying B.E. 2c machines fitted with R.A.F. engines.

### Loss of Air Supremacy.

This charge, the Committee remarks, relates to the period of some six months beginning in about October, 1915. Reports from the Front are singularly diverse as to the extent to which superiority was for a time lost. In some places the German superiority for a time seemed marked, in others it was non-existent. Such local inferiority as there was seems to have been chiefly due to our tardy recognition of the change brought about by the Fokker, but the

Committee think that, although we had at the Front at all times machines capable of dealing with the Fokker on at least equal terms, these machines were not at first available in sufficient numbers. Our temporary loss of superiority has been described in language of such gross exaggeration as to make the Committee at first disposed to think there was nothing in it; but a careful examination of all the facts leads them to the conclusion that the charge is true to a limited extent. Our newer aeroplanes, which are now coming forward in greater numbers, are proving individually superior to those of the Germans; and, while there must be casualties where there is fighting, our early superiority has been more than regained.

### Zeppelins should be Raided in their Lairs.

On the suggestions that the best defence against air raids on this country is to attack the enemy's craft in their bases, the Committee thinks the principle is sound, and does not doubt that it has been carefully considered by the proper authority. As the Committee very properly remarks, the decision as to whether machines should be used for the purpose does not rest with the R.F.C., who can only act at the Front under the orders of the Commander-in-Chief of the Army, and regard must doubtless be had to the demand for aeroplanes for other purposes. We do not appreciate that the suggestion under review was made in the form of a charge against the R.F.C. It is essentially a matter for the Higher Command, and where there was criticism of the failure to carry out long-distance raids on enemy aircraft bases, it was against the authority charged with defence as a whole that it was levelled, and not specifically against the R.F.C. There is, it must be said, a good deal in the argument that the great advance of the German Army into France and Belgium has had the effect of making the journey to many of the Zeppelin bases longer than was anticipated. That, however, does not dispose of the failure to carry out an important number of raids on the nearer bases.

On the whole the Committee has given us a very fair summing up of the evidence, and its conclusions must be admitted to be thoroughly sound on the weight of evidence submitted to it. As we purpose publishing the Report in full, including the additional valuable recommendations by Mr. Charles Bright, in the pages of "FLIGHT," following up the Committee's recommendations, which we published in last week's issue, our readers who are interested will be able to judge of that for themselves.

### The Life of the Air Board.

In reply to Colonel Ashley, the Home Secretary on Wednesday last week confirmed the statement that the intention was that the life of the Air Board should be for the period of the war and for twelve months after. In the course of the year after the war there would be ample time to consider whether the Board should be continued as a permanent institution!

This, on the face of things, appears to us to be an extraordinary view to be taken, in the light of all that has gone before. Unpreparedness due to an inability of the lay mind to appreciate what was

implied in the conquest of the air characterised our condition at the outbreak of war. Concentration of aerial affairs in the hands of those who knew next to nothing about aerial affairs caused us to lag behind the enemy until it was almost too late to recover ourselves. Then came the tardy recognition—which turned out to be only half-recognition after all—that aerial preparation for war was the work of experts, and we had the Air Committee. That failed for the same reasons that had caused failure before—the lay mind was unable to grasp the fundamental fact that, in order to succeed, the people who *know* must be given a free hand. Next came the Air Board fiasco, which again failed because of the continued refusal of the Government to entrust the work of putting our aerial equipment on a proper basis to the very people it had appointed because they knew their business.

When we were told that an Air Ministry was to be constituted we welcomed the news, because we believed that at last things were to be put on a sound and permanent footing. Now, it seems to emerge that at the end of the war we are to relapse into the old half-hearted way of doing things. The Air

Board, in a word, is to be merely a stop-gap affair again, a mere go-between to transact the buying of supplies for the period of the war and to clean up its house before vacating it afterwards. Can no one in authority realise that in the future aerial supremacy is going to mean all that the command of the sea means to us now? Have all the lessons of the war that have been learnt in the air been forgotten already, that we are calmly told in so many words that at the end of the war we shall begin to consider if it is worth while to continue an Air Ministry? Does our Government think that the Germans will be content to let things slide in the same way, supposing that we do not fully succeed in imposing all our own terms on them? And even should the issues of the war turn out to be all that we desire, is there no possibility that another Power may arise desirous of challenging our supremacy? We do not like it at all. We had expected better things of the new Administration, and we trust that later on it may be explained that this statement to which we take the strongest possible exception does not mean what it apparently does.

## THE ROLL OF HONOUR.

Reported by the War Office:—

### Killed.

8839 2nd Air-Mech. D. Buckley, R.F.C., attd. R.G.A.  
2073 1st Air-Mech. O. F. Watts, R.F.C.

### Previously reported Missing, now reported Killed.

Lieut. E. G. A. Bowen, R.G.A., attd. R.F.C.  
2nd Lieut. S. Dendrino, R.F.C.  
2nd Lieut. G. Edwards, R.F.C.  
2nd Lieut. O. C. Godfrey, R.F.C.  
Capt. C. J. Hart, Worcester R. and R.F.C.  
Lieut. J. M. J. Kenny, A.S.C., attd. R.F.C.

### Died of Wounds.

41060 2nd Air-Mech. J. W. Chiverton, R.F.C.  
15557 2nd Air-Mech. E. Lovesey, R.F.C.

### Honours for Mesopotamia Flying.

A SUPPLEMENT to the *London Gazette* issued on Dec. 22nd announced the following honours for services rendered in connection with the military operations in Mesopotamia. They date from June 3rd:—

#### D.S.O.

Capt. (Temp. Major) P. W. L. BROKE-SMITH, R.E. and R.F.C.  
Capt. H. A. PETRE, M.C., Australian F.C.

#### M.C.

Lieut. (Temp. Capt.) J. R. McCrindle, Gord. Hs. and R.F.C.

### More Military Medals for R.F.C.

In a *London Gazette* supplement published on December 21st it was announced that His Majesty the King has been graciously pleased to award the Military Medal for bravery in the field to the undermentioned:—

7258 Corpl. (Actg.-Sergt.) H. BROWN, R.F.C.  
7748 1st Air Mech. W. H. DOWLING, R.F.C.  
10591 Corpl. C. T. GALPIN, R.F.C.  
4917 1st Air Mec. F. S. MACKNELL, R.F.C.  
8847 2nd Air Mech. J. C. MIDDLETON, R.F.C.  
8192 2nd Air Mech. A. E. PITCHER, R.F.C.  
6773 1st Air Mech. A. V. SCHOLLES, R.F.C.  
7754 2nd Air Mech. H. T. TABOR, R.F.C.  
8267 2nd Air Mech. S. H. G. TRIGGS, R.F.C.  
7255 2nd Air Mech. L. G. VENN, R.F.C.  
8237 2nd Air Mech. G. L. G. WATSON, R.F.C.  
8191 2nd Air Mech. L. WILLIAMS, R.F.C.

### Wounded.

2nd Lieut. J. A. Ainscow, R. Warwick, attd. R.F.C.  
Lieut. J. P. Greenwood, A.S.C., attd. R.F.C.  
2nd Lieut. T. Thomson, Argyll and Suth. H., attd. R.F.C.  
4174 Sergt. S. W. Birch, R.F.C.  
524 Sergt. F. E. Darvell, R.F.C.  
22838 2nd Air-Mech. S. A. Gough, R.F.C.  
12325 2nd Air-Mech. H. Naphtale, R.F.C., attd. R.G.A.

### Wounded—Shock, Shell.

16859 2nd Air-Mech. D. North, R.F.C.

### Missing.

Lieut. B. P. G. Hunt, Yeomanry and R.F.C.

### Previously reported Missing, now reported Prisoners of War in German hands.

Lieut. A. H. M. Copeland, Can. A.S.C., attd. R.F.C.  
Lieut. I. M. Johns, Welsh R. and R.F.C.  
2nd Lieut. W. E. Knowlden, Border and R.F.C.

### The Handling of Aircraft Bombs or Darts.

THE Army Council warns the public against approaching, examining or handling explosives, such as bombs or darts, which may sometimes be accidentally dropped from aircraft during practice or may be scattered through the accidental fall of aircraft.

Should injuries be suffered by any person through approaching, examining or handling such explosives, or any other explosives used experimentally or for the training of troops, the Council will not be prepared to pay any compensation.

Persons finding objects of this nature should at once report the matter to the nearest military or police station.

### Pay of R.F.C. Clerks, &c.

A ROYAL WARRANT, issued as an Army Order on Dec. 22nd, amends the rates of pay for warrant officers, non-commissioned officers and men of the Royal Flying Corps employed as clerks in that arm to the following:—Superintending Clerk, 6s. 9d.; Flight-Sergeant, 5s. 6d.; Sergeant, 4s. 9d.; Corporal, 4s.; 1st Class Air-Mechanic, 3s.; 2nd Class Air-Mechanic, 2s.; 3rd Class Air-Mechanic, 1s. 8d.

These rates shall not apply to soldiers now serving as clerks, who will continue to draw their present rates as long as they serve in their present ranks. On promotion, however, they shall be paid the rates now laid down, unless in any case the rate they are now drawing is higher than the new rate of the rank to which they are promoted. In that case they may continue to draw the rate they are now drawing.



# The British Air Service

"PER ARDUA AD ASTRA"

UNDER this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the LONDON GAZETTE, it is not repeated in this column.

## Royal Naval Air Service.

*Admiralty, December 19th.*

R. M. Stirling entered as Prob. Flight Officer, Dec. 14th, and appointed to "President," additional, for R.N.A.S., date Dec. 31st.

H. L. Macre entered as Prob. Flight Officer, Dec. 15th, and appointed to "President," additional, for R.N.A.S., date Dec. 31st.

Sub-Lieut. R. N. (Flight Lieut.) A. W. Mylne promoted to Acting Lieut., date Dec. 15th.

*Admiralty, December 20th.*

The undermentioned have been entered as Prob. Flight Officers for temp. service, and appointed to the "President," additional, for R.N.A.S., to date Dec. 31st; J. A. Cole, K. F. Alford, T. H. Herriot, G. H. Herriot, W. M. Davidson and A. D. Pole.

*Admiralty, December 21st.*

Temporary Sub-Lieutenants, R.N.V.R.—S. A. Bevington and A. C. Baker, promoted to the rank of Temp. Lieut., R.N.V.R., seniority, Dec. 18th.

C. R. Knowles entered as Prob. Flight Officer for temp. service, date Dec. 18th.

## Royal Flying Corps (Military Wing).

*London Gazette Supplement, December 18th.*

*Temporary Appointment at War Office.*

Staff Lieutenant.—2nd Lieut. T. Goulburn, R.F.C., S.R., from an Equipment Officer, 3rd Cl., vice Temp. 2nd Lieut. (Temp. Capt.) H. W. Phear, Gen. List; Nov. 15th.

*London Gazette, December 19th.*

**Flying Officers.**—Nov. 6th: Temp. Capt. E. F. Elderton, Ches. R., and to be transfd. to Gen. List; Lieut. W. J. Cairnes, Leins. R., S.R., and to be secd. Capt. E. W. Broadberry, Essex R., T.F.; Nov. 8th. 2nd Lieut. A. E. L. Skinner, Norfolk Yeo., T.F.; Nov. 9th. Nov. 14th: Temp. Capt. K. R. Paterson, R. W. Fus., and to be transfd. to Gen. List; 2nd Lieut. L. W. Heathcote, Australian Flying Corps, 2nd Lieut. (Temp. Lieut.) T. F. Preston, Norfolk Yeo., T.F.; Nov. 22nd. Nov. 27th: Lieut. H. C. Burdett, T.F. Res.; 2nd Lieut. H. J. Hamilton, D. of Corn. L.I., from a Flying Officer (Obs.), with seniority from Aug. 30th; 2nd Lieut. G. F. Blackburn, S.R. Nov. 28th: Temp. 2nd Lieut. C. J. Dickinson, R. W. Kent R., and to be transfd. to Gen. List; 2nd Lieut. G. W. Dowding, S.R.; Temp. 2nd Lieut. E. H. M. Fetch, Gen. List; 2nd Lieut. (Temp. Lieut.) E. A. Stewardson, R. W. Surr. R., T.F.; 2nd Lieut. G. R. Beck, London R., T.F.; Temp. 2nd Lieut. (on prob.) H. L. Barlow, R.E. Nov. 30th: Lieut. F. L. Baker, 67th Canadian Inf. Bn.; Temp. 2nd Lieut. P. S. Williams, Gen. List.

**Equipment Officers, 2nd Class.**—From the 3rd Cl., Dec. 1st: 2nd Lieut. (Temp. Lieut.) W. R. Bruce-Clarke, Lon. R., T.F., and to retain his temp. rank whilst so employed; Temp. Lieut. H. N. Nowell, Gen. List. From the 3rd Cl. and to be Temp. Lieuts. whilst so employed: 2nd Lieut. G. Jacques, S.R.; 2nd Lieut. E. W. Havers, S.R.; Temp. 2nd Lieut. J. D. Drysdale, Gen. List; 2nd Lieut. F. C. Rowe, S.R.; 2nd Lieut. J. MacD. Patten, S.R.; Temp. 2nd Lieut. A. K. Hall, Gen. List; 2nd Lieut. J. E. R. Avery, S.R.

**3rd Class.**—2nd Lieut. (on prob.) J. T. Rossiter, S.R.; Sept. 1st. 2nd Lieut. (on prob.) E. T. Driver, Gen. List; Oct. 2nd. Temp. 2nd Lieut. L. Legge, Gen. List; Nov. 11th.

**Memoranda.**—The undermentioned to be Temp. 2nd Lieuts. (on prob.) for duty with R.F.C.: Cadet J. G. Harriott, from an Officer Cadet Bn.; Nov. 22nd. Dec. 8th: Sergt. J. A. Atkinson from H.A.C., T.F.; Pte. A. D. Birkhead, from L'pool R., T.F.; Flight-Sergt. E. A. Tottle, from Hampshire Aircraft Parks, T.F.

**Supplementary to Regular Corps.**—The undermentioned 2nd Lieuts. (on prob.) are confirmed in their rank: A. L. Constable, B. Gaskin, F. I. Fleming, H. T. Lydford, A. C. Reeves, W. L. Shaw, A. Graham, J. F. B. Smith, J. C. Rimer, A. Burgess, R. A. W. Collet, J. Farquharson, W. T. Davis, J. Page, A. C. Day, F. J. E. Stafford, R. G. Robson,

F. C. Smith, H. Simson, V. T. Norminton, G. F. Blackburn, W. F. Dobson, E. Armitage, H. Blofeld, G. W. Dowding. The undermentioned to be 2nd Lieuts. (on prob.): Nov. 21st: C. R. F. Wickenden, J. W. G. Boyd, C. L. Hardy; Dec. 1st. Dec. 8th: P. P. Nicholl, D. H. Blaikie, J. C. F. Williams, H. L. Dawson, C. G. Sweet, M. Thompson, H. C. Perks, V. S. Holbrook, R. Knott, P. Ogden, C. E. Fairburn. The notification in the Gazette of Nov. 11th of the appointment of L. A. Owen to be 2nd Lieut. (on prob.) is cancelled.

*London Gazette Supplement, December 20th.*

The undermentioned to be 2nd Lieuts. for service in the Field:—For duty with R.F.C.: Acting Sergt.-Maj. J. D. Payne, from R.F.C.; Oct. 30th. Corpl. B. Ankers, from R.F.C.; Nov. 5th.

The undermentioned to be Temp. 2nd Lieuts. (on prob.):—For duty with R.F.C.: Corpl. C. S. Goodfellow, from R.E.; Oct. 29th. Nov. 14th: Acting-Sergt. P. S. Taylor, from A.S.C.; Pte. F. Tapping, from Can. A.S.C.

**Flight Commanders.**—From Flying Officers, and to be Temp. Capt. whilst so employed: 2nd Lieut. (Temp. Lieut.) R. L. Chidlaw Roberts, Hamps. R.; Dec. 4th. Dec. 5th: 2nd Lieut. W. H. Tolhurst, S.R.; 2nd Lieut. (Temp. Lieut.) B. P. G. Hunt, Shropshire Yeo., T.F.; 2nd Lieut. H. A. Wood, S.R.

**Flying Officers.**—Nov. 27th: Lieut. (Temp. Capt.) H. F. Game, R. War. R., S.R., to be second., and to relinquish his temp. rank; 2nd Lieut. (Temp. Lieut.) C. S. Vane-Tempest, Durh. L.I., T.F.; Temp. Lieut. A. N. Solly, Gen. List, from a Flying Officer (Obs.), with seniority from July 27th; 2nd Lieut. R. H. Dryden, Northumbrian Brig., R.F.A., T.F.; Temp. 2nd Lieut. A. Binnie, R.A., to be transfd. to Gen. List; 2nd Lieut. H. Simson, S.R. Nov. 28th: 2nd Lieut. T. M. Southorn, Lowland Brig., R.F.A., T.F.; Temp. 2nd Lieut. A. A. Harcourt-Vernon, E. Surr. R., and to be transfd. to Gen. List. Nov. 29th: Temp. 2nd Lieut. C. O. B. Beale, Gen. List; Temp. 2nd Lieut. (on prob.) W. G. Holbrow, Gen. List; 2nd Lieut. H. Blofeld, S.R.; Temp. 2nd Lieut. J. MacGeorge, Gen. List. Nov. 30th: 2nd Lieut. C. Eales, Devon R., T.F.; Temp. 2nd Lieut. C. R. H. Jackson, Gen. List; Temp. 2nd Lieut. W. Selwyn, Gen. List; Lieut. A. T. Eden-Eadon, N. Staff. R., S.R., and to remain secd.; Temp. 2nd Lieut. G. C. Holman, A.S.C., and to be transfd. to Gen. List; 2nd Lieut. C. J. Pullen, E. Anglian (Essex) R.G.A., T.F.; Temp. 2nd Lieut. (on prob.) C. J. Hewins, R.E.

**Adjutant.**—Capt. J. D. Strong, 90th Punjabis, Ind. Army; Nov. 8th.

**Depôt Commander.**—Capt. (Temp. Maj.) G. B. Haynes, R.A., from a Park Comdr. and to be Temp. Lieut.-Col. whilst so employed; Nov. 1st.

**Park Commanders.**—From Equipment Officers, 1st Cl., and to be Temp. Majors whilst so employed: Capt. L. F. R. Fell, S.R.; Nov. 1st. Capt. R. Hall, R.W. Fus., and to be secd.; Dec. 6th.

**Equipment Officers, 1st Class.**—From the 3rd Cl., and to be Temp. Capt. whilst so employed; Nov. 1st: Temp. Lieut. E. M. Bettington, Gen. List; 2nd Lieut. W. D. L. Jupp, S.R.; Dec. 1st: Temp. 2nd Lieut. (Temp. Lieut.) P. B. Hunter, A.S.C.; 2nd Lieut. C. G. Smith, S.R.

**Equipment Officers, 2nd Class.**—From the 3rd Cl., and to be Temp. Lieuts. whilst so employed: 2nd Lieut. T. Bullen, Som. L.I.; Nov. 1st. Dec. 1st: 2nd Lieut. H. R. Vagg, Som. L.I.; 2nd Lieut. S. G. Frost, S.R.; Temp. 2nd Lieut. A. S. Ellerton, Gen. List; 2nd Lieut. L. H. B. Cosway, S.R.; 2nd Lieut. A. R. Thomas, S.R.; Temp. 2nd Lieut. A. S. Morris, Gen. List.

**Wing Instructors in gunnery (graded as Flight Commanders).**—From Flying Officers. Sept. 14th: Lieut. (Temp. Capt.) A. G. H. Carr, York and Lanc. R., T.F., and to retain his temp. rank whilst so employed; Capt. R. Bell-Irving, 29th Canadian Inf. Bn.; Temp. Capt. H. E. Dixon, Gen. List. From Flying Officers, and to be Temp. Capt. whilst so employed: Temp. Lieut. S. H. Bird, Gen. List; 2nd Lieut. (Temp. Lieut.) W. G. B. McKechnie, R. Sc. Fus.,

and to be secd.: Temp. 2nd Lieut. G. Ross-Soden, Gen. List. Sept. 21st: Temp. Lieut. S. E. Adams, Gen. List; Temp. 2nd Lieut. W. H. Miles, Gen. List; 2nd Lieut. R. G. Heyn, S.R.; 2nd Lieut. M. R. N. Jennings, S.R.; Oct. 4th. Capt. M. G. B. Copeman, Leic. R., a Flight Comdr.; Oct. 27th.

The undermentioned 2nd Lieuts. (on prob.), S.R., to be Temp. Lieuts. whilst serving with R.F.C. Nov. 1st: C. H. Knight, Dorset R.; N. Brearley, M.C., L'pool. R.; D. G. A. Allen, Durh. L.I. (Substituted for the notification in the Gazette of Dec. 16th.)

Supplementary to Regular Corps, Royal Flying Corps, Military Wing.—2nd Lieut. (on Prob.) J. H. G. Wilson resigns his commission; Dec. 21st.

London Gazette Supplement, December 21st.

Wing Commanders.—From Sqdn. Comdrs., and to be Temp. Lieut.-Cols. whilst so employed. Dec. 5th: Capt. (Temp. Maj.) the Hon. J. D. Boyle, Rif. Brig.; Capt. (Temp. Maj.) P. K. Wise, R. War. R.; Capt. (Temp. Maj.) W. F. MacNeece, R.W. Kent R.; Temp. Maj. F. H. Cleaver, Gen. List; Temp. Maj. the Hon. A. S. Byng, Gen. List.

Flight Commanders.—From Flying Officers, and to be Temp. Capts. whilst so employed. Dec. 6th: Temp. Lieut. J. M. E. Shepherd, Gen. List; Temp. Lieut. K. F. Balmain, Gen. List.

Flying Officers.—Nov. 28th: Temp. 2nd Lieut. F. F. H. E. Kolligs, N. Lan. R., and to be transfd. to Gen. List; 2nd Lieut. A. E. Townsend, Durh. L.I., T.F.; Temp. 2nd Lieut.

B. Mews, Gen. List; Temp. 2nd Lieut. W. T. Price, attd. R. War. R. Nov. 29th; 2nd Lieut. R. G. Robson, S.R.; 2nd Lieut. F. C. Smith, S.R.; Temp. 2nd Lieut. J. H. Hayward, Gen. List; Temp. 2nd Lieut. F. P. Holliday, Gen. List, from a Flying Officer (Ob.), with seniority from Mar. 10th; 2nd Lieut. J. L. Bicknell, Glouc. R., T.F.; Temp. 2nd Lieut. A. J. Lucas, Gen. List; Temp. 2nd Lieut. C. F. Jex, Gen. List; 2nd Lieut. F. J. E. Stafford, S.R.

Equipment Officers, 2nd Class.—From the 3rd Cl. Dec. 5th: Temp. Lieut. W. B. Cushion, Gen. List. And to be Temp. Lieuts. whilst so employed: 2nd Lieuts., S.R.; G. A. Crane, C. G. Jones, L. A. Clayton, J. E. Rendle.

3rd Class.—Dec. 6th: Temp. 2nd Lieut. (on prob.) S. R. Winkworth, Gen. List; 2nd Lieut. (on prob.) H. Wilson, S.R.; 2nd Lieut. E. G. Webber, Gen. List; 2nd Lieut. F. R. Wilkins, Gen. List; Temp. 2nd Lieut. (on prob.) G. H. Creighton, R. Ir. Fus., and to be transfd. to Gen. List; Temp. 2nd Lieut. (on prob.) F. J. Cunningham, Gen. List; 2nd Lieut. (on prob.) C. E. Bagram, S.R.; Temp. 2nd Lieut. (on prob.) A. W. Barnett, Gen. List; Temp. 2nd Lieut. (on prob.) S. H. Child, Gen. List; Temp. 2nd Lieut. (on prob.) J. B. Crabb, Gen. List; 2nd Lieut. L. H. Clifford, S.R.; 2nd Lieut. (on prob.) R. J. Anderson, Lowland Divl. Engrs., R.E., T.F.; Temp. 2nd Lieut. (on prob.) J. H. A. Bryne, Gen. List; Temp. 2nd Lieut. C. H. Blakeway, Gen. List; 2nd Lieut. (on prob.) E. Brown, S.R.; Temp. 2nd Lieut. (on prob.) B. O. Butler, Gen. List; Temp. 2nd Lieut. (on prob.) H. W. Armstrong, Gen. List.

## The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

### New Club House.

The address of the Club is now 3, Clifford Street, New Bond Street, W.

The new premises will be open to Members on January 3rd, 1917.

### Suspension of Entrance Fees of New Service Members.

Until further notice, Service Members will be elected to the Royal Aero Club without Entrance Fee.

### Annual Subscription.

In accordance with the resolution passed unanimously at the Special General Meeting of the Members held on the 27th July, 1916, "the subscription to the Club for the year 1917 and thereafter will be £5 5s."

### Servants' Christmas Fund.

The Subscription List for this Fund is now open.

### THE FLYING SERVICES FUND administered by THE ROYAL AERO CLUB.

THE Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The Fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers, and men.

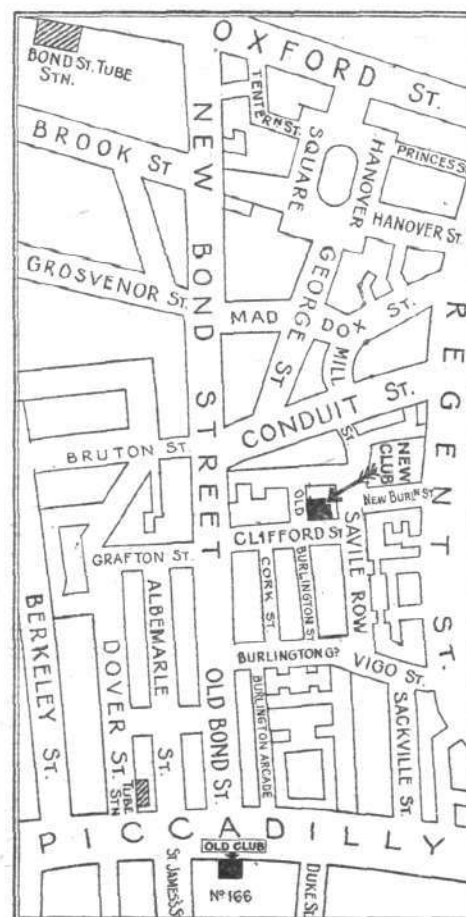
Forms of application for assistance can be obtained from the Royal Aero Club, 3, Clifford Street, New Bond Street, W.

### Subscriptions.

	£	s.	d.
Total subscriptions received to December 21st, 1916 .. .. .	11,098	13	3

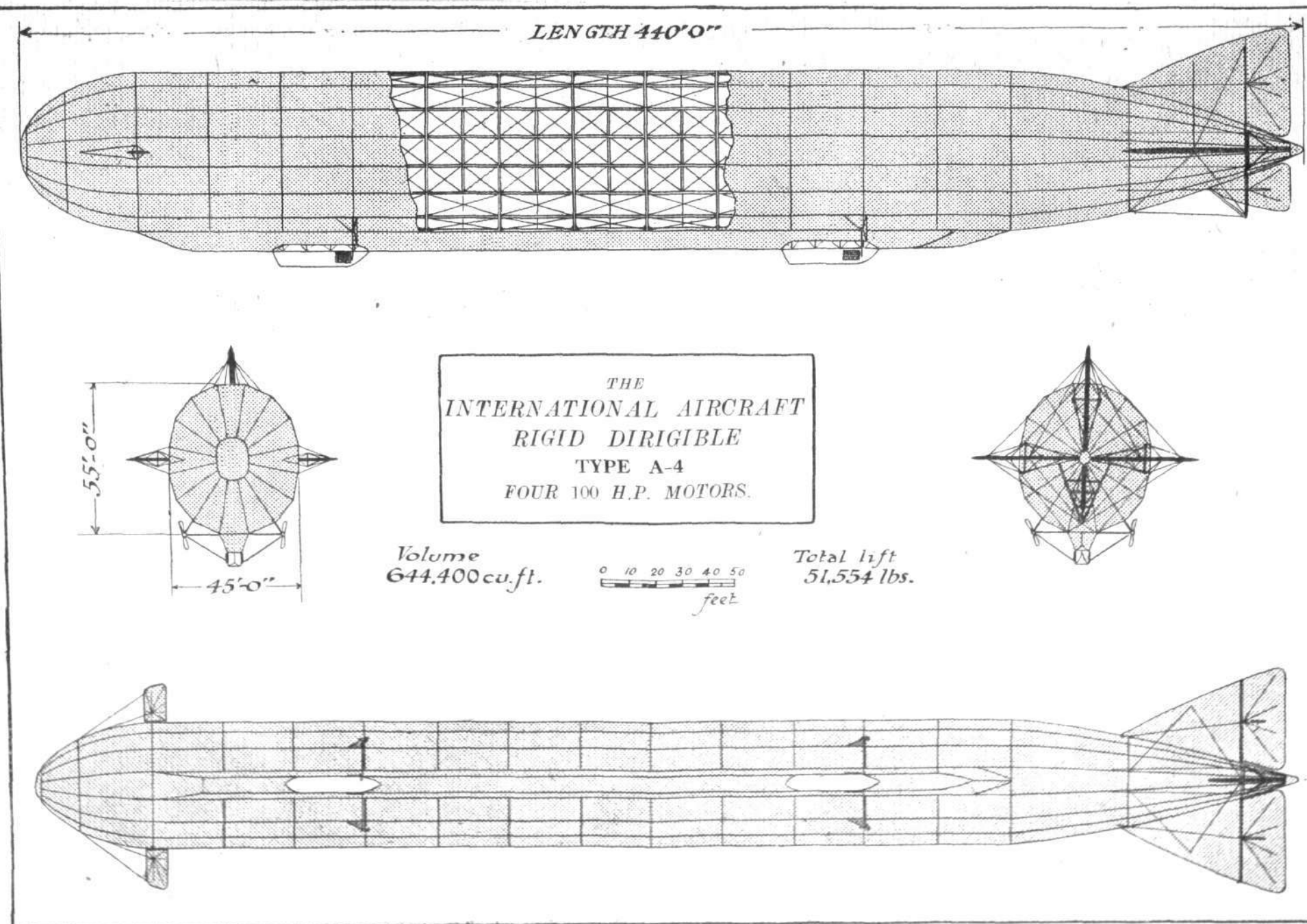
B. STEVENSON, Assistant Secretary.

3, Clifford Street, New Bond Street, W.



Plan showing position of New Club Building, 3, Clifford Street, New Bond Street, W., which will be opened on Wednesday, the 3rd January, 1917.





THE INTERNATIONAL AIRCRAFT RIGID DIRIGIBLE.—Plan, side and end elevations to scale. (See next page.)

## THE INTERNATIONAL AIRCRAFT RIGID DIRIGIBLE.

The following interesting particulars of an American design for a rigid dirigible appeared in a recent issue of *Aircraft*:—The International Rigid Dirigible, the rights and patents of which were bought out by the American Aircraft Co., embodies the most successful engineering features that have been learned through practical experience and observation and study by its engineers in both Europe and America. Many original ideas in regard to their construction and operation are employed. Aside from the completed general design of this type of craft, also all technical data that could be collected in regard thereto, empirical tests to ascertain its resistance, stability, steerability and side stresses have been made at the Navy Yard at Washington, D.C., as well as at other technical institutes, tests were made of constructional features. These tests were observed by Mr. Louis L. Kaess, Mr. Vincent J. Buranelli and Mr. Maximilian Jagemann, designers and experts connected with the Company. The designs for four types have been got out, but the accompanying particulars refer to the largest type ("A4").

The over-all length of the balloon frame is 440 ft., and is oval in shape, having a maximum diameter of 55 ft., and a minimum diameter of 45 feet. The object of employing this oval system of construction is to obtain vertically a high strength to weight ratio, since the major forces acting on a dirigible are vertical. This is due to the fact that the most serious side stresses act vertically, such as when the balloon is climbing, and also the overhung buoyancy, the moments of which due to the length become considerable. The fineness ratio of the hull or balloon frame is 8.75. This ratio, which is low compared to the old Zeppelin, greatly reduces the moments of the overhung gas, for the lift is more concentrated. Also gives a higher cross section, thereby increasing the constructional efficiency of the entire framework. Another feature brought about due to the oval formation transversely, is that the gas containers, being oval in shape, and as their tendency is, when made cylindrical, to pull in this section, there is then a more even distribution of pressure.

The hull is a 16-sided polygon, having 15 compartments having an average length of 25 ft. There are 13 straight compartments, and three tapering—one in the front and two in the rear. The total displacement of the hull is 644,400 cubic ft., having a total lift of 51,554 lbs. The average volume and lift per compartment is 42,900 cubic ft. and 3,437 lbs. respectively. The centre of buoyancy of the balloon is 45 per cent. back. Beneath the hull is a square keel, which is 300 ft. in length. This keel is constructed of members similar to those employed for side members in the hull, the top members being integral with the hull. The purpose of this keel is to act as a backbone, and strengthen the balloon vertically as well as to some extent transversely. 30 per cent. of the strains acting on the balloon frame will be taken up by the keel. Numerous stress diagrams and tests made in regard to the construction of this hull show that a factor of safety of 2.5 is possible. This is very high for a rigid dirigible, and is sufficient, considering that, unlike an aeroplane, a rigid dirigible is not subject to the great variation of pressure due to its dynamic support being altered by dives or gusts. This high factor of safety is possible in this case, due to features which have been incorporated in its design, which, in some cases, require the sacrificing of certain efficiencies, as, for instance, in regard to speed. Also, the hull, which is to be constructed of a combination of steel and aluminium alloy girders, will be heavier than that of European rigid ships, thereby reducing the percentage of useful load that can be carried, but increasing the factor of safety. This hull construction, which will consist in the main girders of members 8 ins. square, will be trussed with double 4,000 lbs. cable at the centre. This trussing will vary, as do the moments of the forces, both dynamic and static acting on the ship from its centre of buoyancy and gravity to the end.

Attached to the rear of the balloon frame at its centre is the empennage, which consists of the horizontal and vertical stabilisers and rudders. These surfaces are monoplane, and have a total area of stabiliser of 2,049 sq. ft. The elevator flaps have a total area of 1,174 sq. ft., and the rudder of 600 sq. ft. These surfaces are trussed securely to the hull by means of cables that are anchored to a mast below the balloon,

which is attached to the last ring. The depression wires are attached to the vertical stabiliser, which in turn receives its support from them. This empennage is located so that the centre of pressure of the elevator flaps is at a distance of 242 ft. from the centre of gravity. At a distance forward from the centre of gravity of 158 ft. two auxiliary elevators are located, one on each side, having an aspect ratio of 2 to 1, and an area of 182 sq. ft. These elevators, being operated separately, can be put either positive or negative, as compared to the rear elevators, thereby making possible an increase of lift dynamically without the balloon being inclined from the horizontal. Wind tunnel tests show that with both surfaces positive the lift at 60 m.p.h., when the front elevators are inclined at a greater angle than the rear, so as to counterbalance them, due to its lesser surface, amounts to 3,600 lbs., at an average of 8 degrees, thereby making possible a considerable increase of altitude. When the front surface is positive and the rear negative at 10 degrees, the lift on the underside of the hull, due to its inclination, amounts to 4,200 lbs. at 60 m.p.h. Also, at the above-mentioned speed the controls, when used to their fullest extent, have six times the effect necessary to elevate or direct the balloon. Due to this, it is possible to still navigate or direct the balloon at a speed of 20 m.p.h.

These large elevating surfaces are equipped with tillers 5 ft. in height, to which are attached the  $\frac{1}{8}$ -in. cables which run to the gondola through the inside of the hull. In order to make possible operating these controls by one man, a mechanical advantage has to be employed at the gondola controls of 1 to 12. This is brought about by the use of lever and ratchet mechanical devices. The front elevators are operated by a lever directly opposite the lever operating the rear elevators, and with a reduction of 1 to 3 for simplicity and ease of operation. The rudder is operated by means of a wheel and sprocket arrangement.

Ballast of the water variety is used and is released by means of a valve, operated at the will of the pilot. The gas is released through three valves, one located at the bottom, used for inflation, commonly termed the "tail" valve; and a concentric safety and manœuvring valve, located at the top of the gas bag, and operated by means of a cord which passes through the tail valve at the bottom. The safety valve works automatically.

There are two gondolas, 32 ft. in length, with a beam of 6 ft. and a depth of 5 ft., directly attached to the keel, and streamlined as much as possible. The keel covering at the gondolas is removed to provide a view for the occupants. The front gondola contains all the controlling apparatus, and the rear one most of the crew. The space in the keel amidships can be used for passenger accommodation, it being square and quite adaptable for this purpose. The distance between the two gondolas is about 150 ft., and the gondolas are counterbalanced about the centre of buoyancy. Their location is such as to eliminate as much as possible uneven buoyant forces. The petrol and ballast tanks are located at the bottom of the gondolas, and equally divided between each gondola. The consumption or release of ballast must be such as to cause no unequal weights to any great extent in either gondola.

There are four motors, which total 400 h.p. The motors are of the 6-cylinder, 4-cycle, vertical type, and are mounted side by side at the rear of each boat. These motors run at a speed of 1,400 r.p.m., and are easily accessible. A gear-box located at the driving end of each motor contains gearing mechanism, which, by means of shafting, transmits the power to the propellers, which are overhung at the side of the balloon frame. These propeller brackets are covered in to act somewhat like a bilge keel. No clutches are to be employed, nor are they necessary, considering that the modern aeronautical motor can be throttled at an ineffective propeller speed. The gear ratio is 1.4 to 1, the propeller turning at 1,000 r.p.m. The propellers have a diameter of 9 ft., 7-foot pitch, and are made of laminated wood.

The air pumps for the air ballonet are operated by one of the engines in each car.

Wireless apparatus is located in forward gondola, the current being supplied from a dynamo driven by one of the motors.





# ARMCHAIR REFLECTIONS

BY THE "DREAMER"



WHEN the history of the war comes to be written—I have an idea I've seen that phrase before—I hope somebody, or a syndicate of somebodies, one from each of the numerous flying bases in France, Egypt, Salonica and the various other places where bases are established, will write the history of the war from the flying-man's point of view, for I am sure there is material there for one—or half a dozen—of the most interesting and instructive books ever written for those concerned with the riding of the wind.

The history of the war will, as a matter of course, be compiled in the usual way, and the deeds of our heroes of the air will be included; but it is poor stuff, that which is written by the professional history writer. I have some of those history books on my bookshelf, they are on the topmost shelf, and I do not possess a pair of library steps, by which you shall guess that the dust lies thick upon their upper edges. I can see some of them as I write. There are among others *The Thirty Years' War*, *The Siege of Paris* and *With the Flag to Pretoria*, all good enough books in their way, but of little interest to the man who was not a soldier either by birth or inclination. They miss the human note, these weighty tomes, and they miss the humorous. Full enough they are, what I remember of them, of the inhuman. If you want to read of regiments becoming ambushed and swept away, if you want to know about men laden like pack-mules marching at the dead of night over strange country led by a guide in the employ of the enemy, with the inevitable result, if you have a taste for knowing of the thousand and one manners in which men can be swept away to eternity like chaff before the wind, I commend you to my top shelf.

*The Thirty Years' War* shall find you reading for a year, with another added in making up your tables of killed and wounded if you are fond of that sort of thing. Or you shall read of Paris during, if I remember rightly, the five months or so, from September to January, with the iron hand of Germany gripping it tightly; of the nine days of bombardment, during which less damage was done than on any one of our little bombing raids. Spion Cop may interest you if you have the right appetite, but not one word of humour shall you find between the covers of the books on that high shelf.

The book that I want is in the writing by men who have an eye for life, and not for death. Just how our boys live out there, and the schemes they get up to in their endeavours to make themselves comfortable under trying circumstances. The story of their little concerts and theatrical efforts, the story of all that which has happened to them, and the stories, those wonderful stories, of all that which never happened, but which are jolly good yarns nevertheless, although born of the imagination.

I wish it were my lot to write that book; I have enough yarns in stock at the present moment to half fill it. These yarns get told around at times, but only the very few ever hear them. Here is one, as a sample, showing what strange things even the bravest of the brave will do under stress of circumstances, and when caught unawares. I will give it in sequence as told to me by the pilot, whom I will call Mr. A.:—It was in the early days, and he and an observer had to take a machine from ——— to ——— for delivery. Darkness found them at ———, where they decided to stay the night. Here Mr. A. will take the helm. "We were mooching about with nothing to do, when the doctor asked if we would like to go up and see his hospital. This was early in the war, and I had never heard a gun fire or a bomb drop, having only just got out there. I was sitting on the side of a cot talking to one of the fellows, when, crash! Of course the Germans had selected that very place and night for a firework display. I rushed out to find all lights extinguished except one large electric light in the yard, for which nobody could find the switch. I got a pair of steps with the idea of taking the lamp out. Halfway up, bang! crash! I fell off, I don't mind telling you. Up again. I would *not* be frightened like that. Near the top I missed a step. I missed it several times. Bang! (much nearer). I would *NOT* funk, I would go slowly. I went slowly and missed the step again, for the simple reason that it was not there. I got the lamp out and got down. Crash! not far from where I was standing. Mind, I'd never heard anything like it before. That last one did it, I was in a blue funk. My observer, Mr. B., had been through the mill before. I could not see him in the dark, but I guessed he was calmly looking on somewhere. There was a locomotive standing on a siding. I gave a look round lest I should be seen. A bang not 50 yards away knocked what little pluck I had left in me to smithereens. I dived head first under that locomotive whack on top of somebody else. 'Helloa, A.,' said a voice I knew, 'you here?' It was my observer."

Now, are not the thousands and thousands of yarns of that description that are going about worth writing up, together with life as it is lived out there? I think they are. Just think of the "mud stories" that are being told. The one that follows is evidently rather "stretched," but it is illustrative. A man home on leave was asked whether it was true about the amount of mud. "One day," he replied, "I dropped my cap, which disappeared in the mud. I was walking about looking for it when a voice cried, 'Hi, look out, you're standing on my hand.' 'What the devil do you want to lie about down there for?' I asked. 'Lie about be ———,' was the reply, 'I'm driving a transport.'"

# ANSWERS TO CORRESPONDENTS

If in doubt about anything aviatric, write to "FLIGHT" about it.

G. W. (Southsea).

In describing a rough-and-ready method of finding the pitch of an airscrew, we referred to theoretical pitch, taking the chord angles as being equivalent to the true helix angles. In practice this is not, of course, usually so, the chord angles being generally greater than the helix angles. The accompanying diagram will illustrate our point. The lines  $dc$ ,  $ec$ ,  $fc$  and  $ac$  represent the helix angles, which we have called  $a_1$ ,  $a_2$ ,  $a_3$ ,  $a_4$ , respectively. For the sake of clearness we have shown all the chord angles 3 degrees greater than the helix

tapering wing, the centres of pressure would not, of course lie on an axis at right angles to the flight path of the machine. This fact is sometimes made use of by designers in attempting to obtain increased lateral stability, usually by incorporating with the tapering wing a diminishing angle of incidence, counting from the root towards the tip.

A. G. B. (Beckenham).

1. The action of the Pitot tube type of air speed indicator was described in our "Column" on page 750 of our issue of August 31st, 1916. Under the Defence of the Realm Regulations we cannot reply to Questions 2 and 3. 4. Mr. Hawker has, we believe, looped the loop on one of the Schneider Cup type Sopwith seaplanes, but, generally speaking, seaplanes are not suited for this evolution.

J. D. R. (Temple Bar).

The subjects of bird flight and insect flight were pretty exhaustively dealt with in the columns of "FLIGHT" in 1911. One article, entitled "The Vortex Principle of Flight," by T. A. Dring, commences on page 489 of the issue of June 3rd, 1911, and is continued through a considerable number of issues. In this article the movements of an insect's wings, as distinct from those of a bird, are very fully described, and some highly interesting suggestions put forward. The other article, by Dr. E. T. Hankin, M.A., D.Sc., is entitled "A Study of Bird Flight," and the first instalment of this appears on page 691 of our issue of August 12th, 1911. Both articles will, we think, prove of help to you, and certainly aroused great interest and a certain amount of discussion at the time.

N. F. B. (Hamilton).

Your best course would be to enter a good works as an apprentice. Write to some of the firms advertising in "FLIGHT" and ask if they have any vacancies.

A. M. (Belfast).

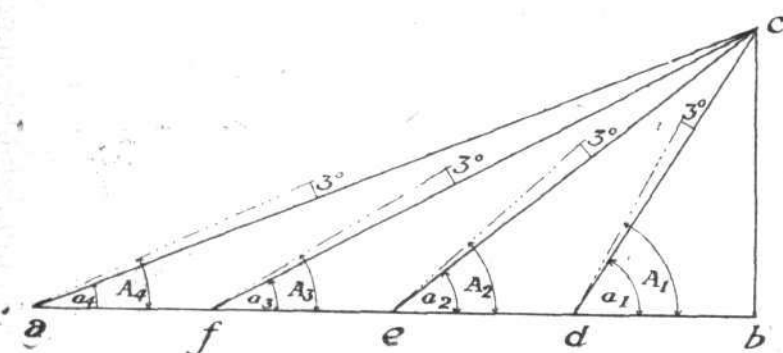
The articles on "Soaring," with the photograph of the Wright glider stationary in the air, appeared in "FLIGHT" of November 11th and 18th, 1911.

Postman (Guildford).

The first aerial post in the United Kingdom was flown between Hendon and Windsor on Saturday, September 9th, Monday, September 11th, and Tuesday, September 12th, 1911, the carriers being Hamel and Driver on Blériots, and Gresswell on a Grahame-White biplane. Hubert on a Grahame-White biplane was also to have made trips, but he had a smash in starting from Hendon on the Monday.

R. E. (Edinburgh).

The first passenger flight on a monoplane was made at Issy-les-Moulineaux on January 5th, 1909, when M. Welfringer carried M. Robert Gastambide on "Antoinette IV" for a distance of half a kilom.



angles, although this does not necessarily represent general practice. As a matter of fact, there are, we believe, propellers in which, at certain points, the chord angles are actually smaller than the helix angles. The angles  $A_1$ - $a_1$ ,  $A_2$ - $a_2$ ,  $A_3$ - $a_3$ ,  $A_4$ - $a_4$ , are called the angles of attack, and correspond to the angle of incidence of an aeroplane wing. In our diagram all these angles of attack are 3 degrees, but they may, as we have pointed out, vary along the blade of the airscrew. Near the boss, where the blade has a small velocity, some propellers have sections resembling a streamline shape rather than an aerofoil section, the blade being here more in the nature of a supporting arm. Consequently in that case the chord angle is the same as the helix angle.

Glider (Kingston).

There is not at present any simple formula from which the amount of dihedral angle can be calculated. It is, we believe, general practice to calculate the position of the centre of projected side area of the whole machine, and then, if this centre lie on the same line as the centre of gravity, to give the wings a dihedral angle of about 2 degrees. If the centre of area lies below the c.g., a greater dihedral is given, and if it lies above it, a smaller. The position of the centre of pressure of an aerofoil can most simply be, and usually is, determined by tests on a scale model in a wind tunnel. In a

## A Double Fatality.

AN inquest was held on December 22nd on 2nd Lieut. P. A. Wright and 2nd Lieut. Frank Leslie Garner, both R.F.C. When flying in a biplane recently the two officers saw a machine that had alighted in a field, and apparently decided to make a descent with a view to assisting their colleagues. Owing to a sudden stoppage of the engine the biplane nose-dived from a height of 400 ft. The engine fell on Mr. Garner, who was killed instantly. The machine burst into flames, and two agricultural labourers released Mr. Wright from the debris and recovered the body of Mr. Garner. Mr. Wright received attention at a V.A.D. hospital, and was afterwards removed to another, where he died within a few hours. Verdicts of "Accidental Deaths" were returned.

## Another Fatal Accident.

AN inquest was also held on Dec. 22nd on Lieut. H. R. Deighton Simpson, R.F.C., who was killed on Dec. 20th.

A witness stated that Lieut. Simpson was an expert pilot, and had been on active service. Immediately before the accident he had looped the loop a dozen times, and flew upside down for some distance. Afterwards he rose as if to loop again, when apparently the right plane gave way as the machine was perpendicular. The pilot regained control of the machine, which started to *vol-plane* down, but from a height of 500 ft. it fell like a stone. A verdict of "Death from Misadventure" was returned.

## Aerial Activity on Salonica Front.

WRITING from Salonica on December 14th, Mr. G. Ward Price states that "German airmen have shown a little more activity lately upon this front, with disadvantageous consequences to themselves. Within three days three enemy machines have been brought down at different parts of our line. One flew over Salonica and was shelled by the Fleet."



## AIRISMS FROM THE FOUR WINDS

WHEN the time comes, it will be highly interesting to see the figures in connection with our National Aircraft Insurance Scheme. There should be a nice comfortable little credit balance to transfer to the other side of the War Balance Sheet, and thus save the much-taxed public a trifle. It seems a pretty profitable game, anyway, for municipalities and other large bodies to be their own insurers judging by the results of the L.C.C. in regard to its own buildings against fire and aircraft risks. The value represents £15,000,000. The premiums this year amounted to £26,600, and the loss to £743. So profitable is this municipal insurance scheme that the insurance fund stands at £163,870. Money saved and invested produces an income of £1,090 a year, more than enough to pay all losses, which have averaged for 10 years only £520 a year. What an object lesson and incentive to go and do likewise.

CAPT. ROALD AMUNDSEN, of South Pole fame, looks to the aeroplane for carrying him upon the last stretch of his journey in search of the North Pole in 1918. Failing his hope that he will drift over the Pole, he has made up his mind to take his chance through the air. Capt. Amundsen ought to know what sort of bric-à-brac should form his impedimenta for the occasion and the sort of appendages and accessories which may help to spell success or failure, so it is as well that he is making himself responsible in this direction by personally supervising the construction of his proposed machine in America. Our only wonder is what he is going to do with the beastly thing—the Pole, not the machine—when he *does* harness it. Perhaps he'll have with him the other end of a wire and be able to try out a "Hello, are you there?" direct to his previous love the South Pole, without waiting for a trunk call around the globe. One thing, when he gets back, he may find the war over.

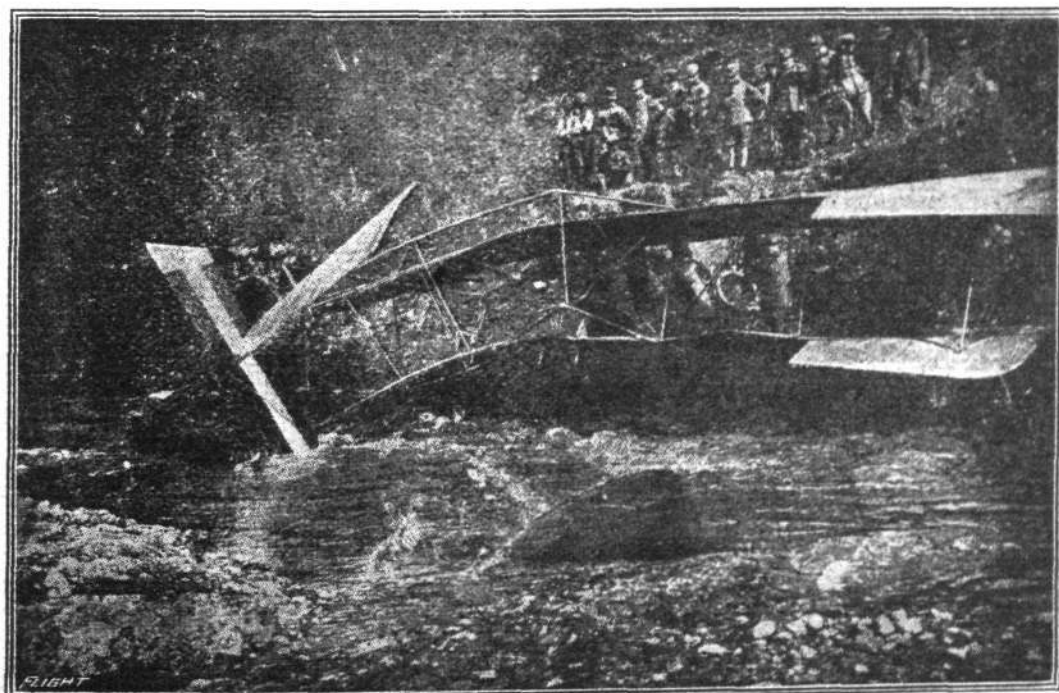
THE accession of the Rev. Haslam to the R.F.C. appears as if it may bring forth a new grade in the Air Services. In no less an oracle than the *Guardian* a plea for "sky-pilots" is put forward by the Rev. H. K. Bros, Chaplain 2nd Cavalry Brigade, writing from No. 1 N.Z. Hospital, France. Thusly he interprets the possibilities of such an innovation, and apparently has the backing of the common or garden strafing

pilot to that end: "I believe I am right in saying that every branch of the Service has its Chaplain except the Air Service. Would it not be possible to have real 'sky pilots' attached to the Flying Corps at various 'wing' or squadron headquarters, who might hold services, when possible, and look after the social side of the mechanics' life—a life which I am told by those who should know is very laborious? I have recently while in hospital met several officers in the Flying Corps, and they all seem to think that it would be a very good thing if Chaplains could be attached to the Air Service. At the present time a branch of the Service whose members perhaps are in more constant danger than any other branch appears to be somewhat left out in the matter of spiritual ministrations."

ACCORDING to a correspondent in America, Laddie Laird, the exhibition pilot, flew over the City of St. Paul, Minn., on election night and flashed the results of the election to the citizens below. Cute idea, that; we might go one better, and start an aerial news-plane—"The Evening Star"—and give Londoners "all the winners" on similar lines, and save paper. We shall have to consult *some* expert as to how this can be worked on the "subscribers only" basis.

WHITENED kerbs, &c., are the antidote of Zepp-raid black night, and so it is to be hoped the response to the Commissioner of Police's reminder to the Metropolitan local authorities will be generous. The Westminster City Council, which is generally the leader in all up-to-date municipal methods, has long since made their posts and refuges conspicuous by this method, and they now go a step further by providing white jackets for their night workmen, so as to help guard them against the traffic.

BERMONDSEY Borough Council is one of the latest bodies to support the action taken by Camberwell in asking the Board of Trade to put forward some legislative measure making all liabilities for damage to persons and property in the British Isles caused by hostile aircraft or by bombardment from enemy's ships or by vibration or damage from same, or from our own defensive armament, a charge upon the Imperial Exchequer.



An awkward landing somewhere on the Austro-Italian frontier.

To all whom it may concern: In response to an inquiry addressed to the American National Advisory Committee for Aeronautics as to the proper terms for designating male and female operators of heavier-than-air craft, the Committee has decided "that the term 'aviator' is a proper term to use in either case. Such terms as 'birdman,' 'birdwoman,' 'aviatrix,' &c., appear undesirable and unnecessary."

THE accompanying illustration, showing an advertisement in a German aviation paper, is interesting. The first part of it reads: "Shock absorbers for aircraft. Substitute for rubber." One is tempted to paraphrase a now historical expression: "This would appear to indicate a scarcity of rubber in Germany!"



THE following bright little pen-picture of life at Salonica is extracted from a letter from Miss Thorburn, who is serving with the Scottish Women's Hospital:—

"Three times lately we have had German aeroplanes right over here. The first time it was most amusing. I had a half-day off, and some of the other nurses were invited on to one of the ships to tea, so they took me. We were having tea in the delightfully comfortable gun-room when suddenly we heard curious scuffings and thuds just over our heads; the door was opened, and one of the men said to the first lieutenant, 'Hostile aircraft about, sir.' Of course

we all flew upstairs on to the deck (I got there first), just in time to see and hear the French, Russian, Italian and Greek battleships, and of course the British, opening fire. As we watched the shells bursting closer and closer to the machine, the whole world seemed suddenly to come to an end with a terrific bang—but it was only one of our guns going off just over our heads. It made my head ring for hours, but it was most entertaining, especially as our shots got closer than anyone else's.

"Just as the gunners were getting the range the machine disappeared over the mountains, and we could hear the guns away in the distance as it flew up country, chased by several local machines. The poor man, who was apparently taking photographs, was shot down and killed on the Monastir road. It is horrible to think of it afterwards, but at the time it seemed only like an interesting and exciting game, and I was delighted to see the shells bursting nearer and nearer.

"We had two more over a few days later, and this time I was at work in the kitchen. The noise was terrific, but they were so high up that they sailed round and round over our heads like storks, taking no notice of the firing or of our machines, which were climbing as hard as they could. These also disappeared safely, but one of them did not get back. We were threatened with a big raid two nights ago, but so far nothing has happened."

## TEN YEARS AGO.

Excerpts from the "Auto." ("FLIGHT's" precursor and sister journal) of December, 1906. "FLIGHT" was founded in 1908.

## ANOTHER SPLENDID PERFORMANCE BY "LA PATRIE."

The long series of experiments with the Lebaudy airship "La Patrie," now the property of the French Government, and in her way the most formidable engine of war that the world has yet produced, has been crowned by a triumphant flight from Moisson, the little townlet of her birth, to the Aeronautical Department's camp at Chalais Meudon, where on the 15th inst. the airship safely arrived and was duly housed after a splendid run through the air from Moisson, a distance of 52 kiloms., accomplished in 1 hr. 12 mins., the start having been made at 10 o'clock in the morning. Deducting the time occupied in mooring at Chalais Meudon, the speed attained through the air is said to have been at least 45 kiloms. an hour, and in fact rather faster, as some more or less complicated evolutions had to be gone through at Chalais Meudon prior to the descent and before the guide-rope could be seized. The airship was under the management of Capt. Voyer of the Aeronautical Department, and her designer and former pilot, MM. Julliot and Juchmes, followed the airship along the road in an automobile, but were unable to keep up with her. A 14 metre wind (a wind of 31 miles per hour) was blowing across the course the airship took, but notwithstanding this serious impediment she maintained an absolutely straight course from start to finish.

On Monday the 17th "La Patrie" went out again, determining in spite of the mist to pay the expected visit to Paris, and at about 3 o'clock left the park at Chalais Meudon for the metropolis. There was a mild south-west wind, which apparently did not affect the airship in the slightest, and without a hitch "La Patrie" arrived about 300 metres above the Elysee Palais at a quarter past three, and announced her presence by hootings on her siren which were distinctly audible in the streets. Finally she passed over the Automobile Club, and returned to Meudon by way of Issy-les-Moulineaux, returning to the shed at Meudon at 3.45. The airship was piloted by Captain Voyer and Capt. Gochet, Lieut. Bois and mechanics Rey and Duguffroy being on board.

## A STEERABLE KITE.

From Aldershot comes an interesting item of news, to the effect that an English sapper of the name of Voisey has designed a very successful kite, which possesses the property of being dirigible to a certain extent, and which it is suggested may be utilised for dropping explosives. Probably its value for scouting purposes will be found considerably greater.

## BARNUM AND BAILEY WANT A FLYING MACHINE.

Messrs. Barnum and Bailey, the well-known American show people, are offering £2,000 for a flying machine of the heavier-than-air type, and a munificent salary to any person who will operate it daily. Will anyone oblige?



The late Capitaine L. de Beauchamp, of Essen and Munich bombing fame, who has recently been killed in the Douaumont region.



## FINAL REPORT OF THE COMMITTEE ON THE ADMINISTRATION AND COMMAND OF THE ROYAL FLYING CORPS, &c.

In our last issue we gave the recommendations embodied in the report of the R.F.C. Enquiry Committee, and this week we give the first instalment of the report itself.

Sir,

1. We, the undersigned, being the Committee appointed "to enquire into and report upon the administration and command of the Royal Flying Corps with particular reference to the charges made both in Parliament and elsewhere against the officials and officers responsible for that administration and command and to make any recommendations in relation thereto," beg to present our Final Report.

2. In our Interim Report, dated August 3rd last, we dealt exclusively with the charge of criminal negligence made by Mr. Pemberton Billing, M.P. We do not refer to that charge again.

3. We sat to take evidence on 22 days, hearing 54 witnesses, between May 18th and August 1st, 1916. Whilst all the charges that have been made in public have been dealt with in public, a material proportion of the evidence has, for obvious reasons, been taken *in camera*. We have personally visited several aerodromes, and inspected a number of machines and watched their flight. During our enquiry a large number of charges or criticisms have been brought to our attention; some of a serious, some of a trivial, character. We investigated them all, but we propose, in this Report, to confine ourselves to those charges and criticisms which seem to us of sufficient importance to be worth recording.

4. Many of the charges and criticisms made before us have been based upon hearsay evidence.

What we have done in every such case is to treat the statements made to us not as evidence of fact, but as indications of the directions in which our enquiries should be prosecuted with the view of obtaining all the reliable information procurable.

5. We have been greatly assisted in such enquiries by the frankness with which the various officers of the Royal Flying Corps have given us their evidence, and by their readiness, and especially that of Lieutenant-General Sir David Henderson, K.C.B., D.S.O., Director-General of Military Aeronautics and in command of the Royal Flying Corps, to give us full access to all documents, confidential or otherwise, and to give us every opportunity of personal inspection of such aerodromes, machines and engines as we desired to see.

6. A greater difficulty has been the reluctance of junior officers of the Royal Flying Corps to appear before us, a reluctance with which we sympathised, and which was overcome in a few instances by the arrangements we made to take this evidence in such a way as to ensure non-disclosure of the identity of the witnesses.

7. A similar reluctance was expressed on behalf of aeroplane and engine builders. Of these, only three or four appeared, although we repeatedly expressed our desire to hear any Trade witnesses who had any serious complaint to make. None of the Trade witnesses who came made any complaint, and two of them went out of their way to express their thanks for the assistance that had been given them in their work by the officials of the War Office.

8. Further, certain criticisms of the administration and command of the Royal Flying Corps were made by witnesses anxious for the well-being and improvement of the Service, upon the mistaken assumption that matters to which they directed attention had been overlooked, because the critics were not themselves aware of the activities of the Royal Flying Corps in those directions. This was inevitable in a Service where much must be done as secretly as possible, especially in war-time.

9. A good many complaints which had been made in public about the Air Service proved, on enquiry, to concern the naval and not the military service.

10. In order to keep our report within tolerable compass we have written memoranda on several subjects involving detail and we append those memoranda\* to this report. We have been the more disposed to take this course as we feel that a good deal of the information in those memoranda cannot well be made public at the present time. We trust

that the body of the report, although less detailed, will be intelligible, apart from the appendices.

11. Before we proceed to deal with the various charges and criticisms submitted to us, it seems desirable to give a general outline of the Royal Flying Corps itself. We set out a more detailed description in our memorandum on the subject in Appendix A.

12. It is sufficient here to say that the Royal Flying Corps consisted of (a) the superior officers; (b) the pilots who fly the machines; (c) the observers; and (d) the mechanics who look after the machines.

13. The Royal Flying Corps is divided into flights, squadrons, wings and brigades. The squadron is the unit. . . .

Pilots are practically all officers. Observers are mostly, but not entirely, drawn from the officer ranks of the Army. Wing Commanders rank as Lieutenant-Colonels.

14. Major-General H. M. Trenchard, C.B., D.S.O., is in command of the Royal Flying Corps in France with . . . General Henderson is in supreme command.

15. The Royal Flying Corps has multiplied more than twenty-fold since the beginning of the war and its growth continues. There is, and always has been since the war, a waiting list of pilot candidates. The difficulty in training them has been want of instructors and of school machines. The former is rapidly disappearing; the latter, to some extent, still remains.

16. Perhaps the most noteworthy feature of the Royal Flying Corps system is that now every pilot must be an officer. Either he is an officer before he joins, or he is drawn from the class of civilians from which army officers mostly come and becomes an officer on joining. Much importance is attached to this fact by the heads of the Royal Flying Corps, who attribute the skill and initiative of the pilots largely to it.

17. In considering charges against the administration of the Royal Flying Corps it is essential to know its strength at the outbreak of war. It is not necessary to repeat here all the figures, but we call special attention to the fact that its equipment in aeroplanes and engines consisted then of 179 machines. Of these, 66 were sent abroad with the Expeditionary Force, and of the remainder only about 20 were in serviceable condition. Thus equipped, the Royal Flying Corps started to serve the Army abroad and to train pilots at home.

18. In Appendix B.† will be found a table showing the number of pilots under instruction on May 1st, 1916, the number of instructors and the training schools. It is a specimen of a daily return and shows how the problem of training pilots is being grappled with.

19. When the development of the British Army is considered—together with its demands for pilots, observers and machines in ever-increasing quantities and on many fronts—it is possible to form some notion of the demands made upon the responsible heads of the Royal Flying Corps, and some idea of the work they were called upon to perform, and that, too, under the stress and strain of war.

20. Many of the charges and, perhaps, the weightiest, were made in respect of the equipment of the Royal Flying Corps, and, in order to understand the bearing of those charges upon its administration and command, it is necessary to look a little into its history. We need not go further back than an Army Order dated August 28th, 1913. By this order a Military Aeronautics Directorate was constituted, with General Henderson as Director-General. This directorate was charged with the equipment of the Royal Flying Corps. In this capacity, General Henderson has charge of the Royal Aircraft Factory at Farnborough (hereinafter referred to as the R.A.F.). The immediate control of the Equipment Branch of the Service is in the hands of Brigadier-General D. S. McInnes, R.E., D.S.O., who, subject to General Henderson, has charge of the R.A.F. at Farnborough, as well as the Inspection Department and the Contracts Branch. There is no connection between the Inspection Department and the R.A.F. except that both form parts of the Equipment Branch and are under the same control.

† Not printed.

\* Not printed.

21. There is thus one responsible head for :—  
 (a) The efficiency of the Royal Flying Corps as an aerial fighting force,  
 (b) Its equipment, and in this connection,  
 (c) The Royal Aircraft Factory, whose functions were described by Lord Curzon in the House of Lords on August 1st, 1916, as being—

- (1) Trial and experiment.
- (2) Research.
- (3) Preparation of drawings.
- (4) Repairs.
- (5) Manufacture of spares.

This description is sufficient for our purpose and we adopt it.

(d) The inspection Department.

22. The Royal Aircraft Factory has been the subject of much criticism before us, and we shall have constantly to refer to it; but it must be understood that we are only concerned with it in so far as its operations have affected the efficiency of the Royal Flying Corps. With its internal administration, its economical or uneconomical working, its business organisation, we have no concern. These matters have been the subject of another and independent enquiry. The relevance of our reference to the Inspection Department will appear when we come to deal with the question of selection of aeroplanes and engines.

23. We have confined our investigations, as far as possible, to the period of the war. The condition of the Royal Flying Corps at the beginning of the war was the result of a policy for which the heads of the Royal Flying Corps are not responsible, but there are two earlier matters to which it is necessary to refer. One is the difficulty experienced before the war in obtaining money for the development and equipment of the service, a difficulty which has disappeared since the war. The other is the decision not to build large non-rigid airships, and the transfer of the few small airships we had to the Navy, against General Henderson's wishes, in January, 1914. Large airships demand high-powered engines. The Germans have had the advantage of working down from their big engines to the smaller ones required for their various types of aeroplanes, while we have had to work upwards from the smaller to the larger engines, a position which has proved to be distinctly disadvantageous.

24. In reading this Report, two things must be kept in mind. First, we have not inquired into the Naval Branch of the Air Service and only mention it incidentally now and again. The Naval Air Service is not included in the terms of the reference to us.

Second, all the witnesses agree that there has been a great improvement in the efficiency of the Royal Flying Corps during recent months. The witnesses who attribute the change to their own intervention and agitation are perhaps the most emphatic and speak of the change as marvellous. We think the adjective not undeserved, although, with all deference to the witnesses referred to, the improvement is, in our opinion, the fruit of the unremitting labour of the Directorate of Military Aeronautics ever since the war began, rather than the result of a spasmodic effort due to agitation.

25. The charges against the administration and command brought to our attention may be divided into two classes, general and specific or incidental. Of these, the general charges are the more serious, and we taken them first.

## GENERAL CHARGES.

26. The general charges are :—

(1) Want of foresight in failing to make provision for the types of aeroplanes and engines which has proved to be necessary.

(2) "Too blind faith in the R.A.F."

(3) A number of charges against the R.A.F., the most important being that :—

(a) The R.A.F. has acquired an ascendancy over the minds of those responsible for the administration of the Royal Flying Corps.

(b) The R.A.F., in the matter of aeroplanes and engines, is the competitor with private firms and the judge of their productions.

(c) The R.A.F. has been a dis-service and not a service to the Royal Flying Corps, in that it has failed to design satisfactory types of aeroplanes or engines, and has discouraged their design and production by private firms.

(d) The R.A.F. has copied designs of private manufacturers for its own use.

(4) The insufficient training of our pilots and observers.

(5) The provision for Home Defence has been muddled and inadequate.

(6) Loss of mastery in the air.

(7) Various defects in aerodromes and in the system of lighting landing grounds.

(8) The inadequate arming of aeroplanes.

It will be observed that charges Nos. 2 and 3 (a) are the same charges approached from opposite points of view, and we deal with them both under charge No. 2.

Charges 1 and 2 to some extent overlap and run into each other, but we have tried to keep them as distinct as possible.

Subject to these observations, we now proceed to consider the general charges in the above order.

## CHARGE NO. 1. WANT OF FORESIGHT.

27. This charge of want of foresight is based, firstly, upon the unpreparedness of the Royal Flying Corps for the war, a condition for which it would be unfair to hold the heads of the Royal Flying Corps responsible. The unpreparedness is undeniable, but it was the result of a policy which was imposed upon them and not determined by them. Nor would any policy which could conceivably have been adopted with the approval of Parliament or the country have provided an air service adequate to the needs of such a war as we are engaged in. Secondly, the charge is based upon want of imagination in foreseeing and providing for the number and types of aeroplanes and engines which now prove to be required. Aeroplanes have to be built to suit the available engines, and not engines to suit aeroplanes. It has been found that, for other purposes than fighting, high-powered engines and big aeroplanes are wanted. For long reconnaissance work, for weight carrying, such as wireless gear, bombs and the like, for artillery observation, and especially for mounting a gun for attacking dirigibles, big aeroplanes and engines are required. In the early stages of the war it seemed that they might be required for fighting purposes also, but the view now held is that for fighting purposes what is wanted is a small, easily manoeuvred, fast machine. The charge of want of foresight practically comes to this: Failure to anticipate the necessity for high-powered engines and to provide for their production. Closely connected with this charge is that of failure to order in due time certain types of engines which, although not exactly high-powered engines, were yet superior to any the Royal Flying Corps had. We deal with this charge under the next head—that of too blind faith in the R.A.F.

28. The position at the outbreak of war was that the engines available did not exceed 80 h.p. Soon afterwards there was the Canton-Unné (Salmson) of 140 h.p. All these have since been discarded. The Royal Flying Corps also got within the first few months the 90 h.p. R.A.F. and 120 h.p. Beardmore—the 90 h.p. R.A.F. in by far the largest numbers. Later the Royal Flying Corps obtained the 100 h.p. Monosoupape and 110 h.p. Le Rhone, the latter in small quantities. Later still the 110 h.p. Clerget, but substantially the highest horse-power engine which the Royal Flying Corps had in quantity for many months was the 90 h.p. R.A.F. Quite recently it has had the 140 h.p. R.A.F., the 160 h.p. Beardmore (originally known as Austro-Daimler, and now sometimes as the Austro-Daimler Beardmore) and the 250 h.p. Rolls-Royce. So far only a few of these higher-powered engines have been delivered; but the output is increasing, and there are now other high-powered engines in sight. The Royal Flying Corps, has, in effect, been carrying on with engines the bulk of which did not exceed 90 h.p. together with a few very efficient 100 to 120 h.p. engines.

29. The state of affairs thus disclosed was obviously unsatisfactory until recently, especially in view of the fact that the Germans have had from the first engines of considerably higher power, notably the Mercedes.

30. In order to understand the position we must go back to the spring of 1914. There was then held a naval and military engine competition for engines of from 90 h.p. to 200 h.p., with a prize of £5,000 for the best engine. There were 67 entries. Of these 23 were of engines from 125 h.p. to 200 h.p. There was only one of the latter. Only nine engines came through the test. The prize was won by the 100 h.p. water-cooled Green Engine. The highest-powered engine to come through was one of 120 h.p.



31. The R.A.F. before the war was designing a 200 h.p. water-cooled engine, and had proceeded some way with the drawings by August, 1914. General Henderson, who was one of the judges at the engine competition, was of the opinion that high-powered engines would be required. He hoped, having regard to the entries for the competition, and the high standing of some of the competitors, that private firms would proceed to develop and perfect high-powered engines, and he stopped the R.A.F. designs, and handed the drawings over to the Rolls-Royce Company and Messrs. Napier. The former declined to proceed on the R.A.F. lines, but designed independently the 250 h.p. Rolls-Royce engine, which is just beginning to be delivered. The Napier Company proceeded with the R.A.F. designs in collaboration with the R.A.F., and their joint efforts have produced a 200 h.p. engine, which is now being tested. There has been some delay in procuring deliveries of the Rolls-Royce engine. No blame can be attributed to General Henderson in that regard. The somewhat longer delay in producing the R.A.F. Napier engine is probably due to joint collaboration.

32. The desire of the Royal Flying Corps for high-powered

engines was well known even before the war, and was the subject of discussion between General Henderson and some of the best known engine builders, a few of whom have attempted to design and build such engines, but hitherto without practical result in the matter of aeroplanes. Some promise well, and in one or two cases where deliveries have been made of high-powered engines attempts have been made to design aeroplanes for them, but, so far, without success.

33. General Henderson stated to the Committee that he made a serious mistake in stopping the R.A.F. from proceeding with their 200 h.p. engine design. We do not agree with him. We see no reason to suppose that the opposite course would have resulted in the earlier production of high-powered engines.

34. It is to be regretted that General Henderson's anticipation of getting high-powered engines from private firms, who knew that they were wanted, was not earlier realised, but that is not due to any fault of his.

35. We think this charge of want of foresight is unfounded.  
(To be continued.)

## AVIATION IN PARLIAMENT.

### The Air Ministry.

In the proceedings in the House of Commons on the Committee Stage of the New Ministries and Secretaries Bill on December 19th, Sir G. Cave Home Secretary, moved the following new clause:—

"For the purpose of organising and maintaining the supply of aircraft in the national interest in connection with the present War, it shall be lawful for His Majesty to establish an Air Board, consisting of a President appointed by His Majesty, who shall hold office during His Majesty's pleasure, and of other members who shall be appointed in such manner and subject to such provisions as His Majesty may, by Order in Council, direct. The President of the Board shall act with the advice of the other members of the Board.

"For the purposes of this Act the President of the Air Board shall be deemed to be a Minister appointed under this Act and the Air Board a Ministry established under this Act."

Sir G. Cave said: The effect of this Clause will be to establish an Air Board. As hon. members know, the Air Board has practically existed for some months. It was formed by the Government, and represents the War Office, the Admiralty, the Ministry of Munitions and several other Departments. The Board has, of course, a President who has considerable power, being a Cabinet Minister, but the Board up to now has had no statutory existence. We are desirous of regularising the present position.

Mr. H. Samuel: We are very ready to assent to this new Clause. There is a very great deal of interest in the Air Board. Its composition and its functions are all of vital importance in the conduct of the War, and of a successful military and naval Air Service. The right hon. and learned gentleman has told us that the new Air Board, which the new Government proposes, will be, in effect, the same as the old Air Board—at least, I understood him so to say.

Sir G. Cave: Yes.

Mr. H. Samuel: The House will be interested to learn that. Indeed, I think that it is revealing no secret to say that one of the last acts of the late Government was to settle the constitution of the Air Board, and I understand that the new Government is continuing the Air Board on the same lines. I do not know whether the Home Secretary can satisfy the curiosity which, I am sure, will be felt by many members of the House at the words of the Home Secretary that Lord Curzon will not continue to be President of the Air Board. If the right hon. and learned gentleman is in a position to tell the House and the country who the head of this important body is to be I am sure the information will be generally welcomed.

Sir G. Cave: I did not say that Lord Curzon would not hereafter be head of the Air Board. I was only desirous of guarding myself against the suggestion that he would continue as head. I am afraid I cannot go beyond that.

The Clause was ordered to be added to the Bill.

The following Clause was also added to the Bill:—

"The Air Board shall in relation to aircraft have such powers and duties of any Government Department or authority

whether conferred by Statute or otherwise, as His Majesty may, by Order in Council, transfer to the Board, or authorise the Board to exercise or perform concurrently with or in consultation with the Government Department or authority concerned."

At the third reading of the Bill, on the following day, Mr. Ashley moved to leave out the Clause regarding the establishment of the Air Board. He said: I move purely formally to leave out this Clause in order to ask what will be the powers of the Parliamentary Secretary of the Air Board which it is proposed to appoint. We shall probably have a whole day after the House reassembles for discussing the constitution and powers of the Air Board. It was promised us by the last Government, and I am quite sure that the present Government will keep that promise. Before we go off for the holidays I wish the right hon. gentleman could give us some indication what will be the powers of this Parliamentary Secretary and what he will answer for, what the composition of the Board will be, and what his powers will be. I am glad to say that the Board has now been turned into an Air Ministry. I suppose it is the work of the right hon. gentleman, and I thank him that we have at last got an Air Ministry, if only in name. I want to know whether their duties will be entirely advisory, or whether they will have executive power. Up to now the Board has consisted of a Cabinet Minister, a member of the other House, a member of this House, and representatives of the Army and the Navy. I want to know whether a representative of the Ministry of Munitions is going to be added to this Board. I would lay great stress on that, and, if it has not been so decided, I would urge upon the right hon. gentleman whether the matter could not be reconsidered. After all, nothing can be done, as the right hon. gentleman knows, without the Minister of Munitions. He has absolute control over all the men and the materials in this country, and this Air Board must come up against the Ministry of Munitions whatever it does. Unless, therefore, there is a representative of that Ministry on the Board I am afraid that there will be great trouble.

There is, as the right hon. gentleman knows, an International Commission in this country which lives at India House, and which buys aircraft material for our Allies. Great power is being given to the Air Board, far greater power, I hope, than it had before, and I would press upon the right hon. gentleman to consider whether it would not be advisable to put on the Air Board a representative of that International Commission; otherwise they will be in a very difficult position in supplying the needs of our Allies. They will have no say at all in the getting of the material, and we may find that our Allies are not properly supplied as they should be. Finally, will the powers of this Air Ministry continue after the war, or will they cease when the war is over? I hope the right hon. gentleman will see his way to make the Ministry permanent. We are told that the Labour Ministry is going to continue. Why should not the Air Ministry continue? It is perfectly obvious that aviation in the future must be of far greater importance than it has been in the past, and why the Ministry should cease—in the case of the Under-

Secretary, six months after the end of the war, and in the case of the Ministry as a whole, 12 months after the war—I cannot see. Surely it would be better to let it remain on and make any a teration in its composition or powers which may be necessary after the war.

Mr. Lynch: I wish to offer a few remarks on this Clause. I think perhaps, they would be more in order on the new Clause. It seems to me that the hon. gentleman who has just sat down in the course of some very valuable remarks has addressed himself to a question which appertains more closely to the new Clause. With my hon. friend I would like to know a little more about the constitution of this new Air Board or Ministry, or whatever it may be called. I would like to lay stress upon one point particularly. The Minister responsible should have a seat in this House. If he is a representative in another place he is far removed from our sphere of action and the greater mental activity which prevails in this House, and really we have no control over him whatever. We have no control, moreover, over his representative, because in nine cases out of ten he simply replies that he will consult his noble friend. He has no authority to give a definite reply to any important question whatever. It seems to me, therefore, not only an important point, but an essential point, that the Minister responsible should be in this House.

We were never able to obtain any definite information with respect to the last Air Board. It seemed to work in the dark, and we were certain only of one thing, and that was that it never produced any valuable result at all. It left the question of air supremacy pretty much where it took it up, and its only effect was that it acted as a sort of breakwater to public opinion and to the opinion of this House in order to delay the solution of this most important question. I hope, therefore, that with the change of Ministry there will be also a change of methods—more activity and more real work, more energy and more determination to produce something definite and concret than has yet been shown by the Board. Failure was stamped on that Board from the very beginning, because, instead of being a real workmanlike Board full of

men of great brain power and with great capacity for producing really valid and bold plans, its composition reminded one of the ornamental names which fill the directorships of showy city companies. Now is a time when we do not want ornamental names or titles or frippery of that sort. We want brains; in fact, I could emulate the Prime Minister yesterday and say three times the same thing. We want brains, brains, brains, and not one tithe of the brains which this country commands has been utilised even in this great new forward Government. Now is the time to watch the composition of this Air Board very closely and to take it as a kind of touchstone showing the real value of this new Government, and how much the country has gained by this great change. Up to the present all the signs have been disappointing. I leave the matter at this stage, to return to it with greater force and with the intention of offering perfectly definite concrete suggestions later.

Sir G. Cave: With regard to the composition and powers of the Board, as my hon. friend will understand, the matter has not yet been finally settled. It is still under consideration, and I am afraid I cannot give him a final answer to-day. I have reason to believe that it is proposed that the Ministry of Munitions shall be represented on the Board, but with regard to the other body mentioned by the hon. member I take a different view from him. I think there would be an objection to having it represented on the Ministry. The proposal is that the Ministry should be created for the war and should continue for a year after the war. That will leave ample time, and I have no doubt that the question of continuing the Board will be taken into consideration as soon as the war comes to an end.

Mr. Lynch: Will the head of the Board be in this House?

Sir G. Cave: I cannot say.

Mr. Montagu: Has any decision been come to yet by the Government as to the means of supplying aircraft?

Sir G. Cave: That is under consideration. It will be considered in a few days as part of the arrangement for setting up the Board.

The Amendment was, by leave, withdrawn.

## SOME OF THE MORE RECENT GERMAN AEROPLANES.

ALTHOUGH up to the present detailed photographs of the latest German aeroplanes now in use on the Western front have not been available for publication, a certain amount of information regarding them is to hand from various sources, which may not, even in the absence of illustrations, be without interest to our readers. The latest *Fokker biplane* is very similar to the fast *Fokker monoplane*. The upper and lower planes are both of the same span and chord, with slightly raked ends. The wings are perfectly straight, that is to say, there is no dihedral angle and no backward slope. On each side are two pairs of inter-plane struts of round steel tube, streamlined with wood, and the bracing is unusual in that lateral stability is maintained by warping instead of, as is now universal practice, by *ailers*, and that therefore there are no incidence wires, while the rear lift and landing wires are at the same time warp wires.

The gap between the planes is very small, so small, in fact, that the top plane almost rests on the upper *longerons* of the body, to which it is attached by a low *cabane*. The tail planes are of the usual *Fokker* type, i.e., the rudder is partly balanced after the fashion of the pre-war *Avros*, while the elevator is identical in shape with that of the *Morane* monoplanes. The body is of the modern *Morane* type, hexagonal in section, and flattening out to a horizontal knife edge at the rear. An *Oberursel* monosoupape engine is fitted and drives a *Garuda* propeller. The machine-gun is fired through the propeller field.

The *Roland biplane*, of which a good deal has been heard lately, is, perhaps, the greatest departure from the beaten track of any modern German aeroplane. It has, according to Mons. Jean Lagorgette in *l'Aerophile*, the peculiarity that its *fuselage* is as deep as the gap between the main planes, the top one of which is actually attached to the upper *longerons* and the bottom planes secured to the lower *longerons* in the usual way. In the modern *L.F.G.*, or *Roland*, biplane the totally enclosed body, which the *Avro* firm were the first to introduce, would appear to have been taken into use for military purposes. There can be little doubt that for winter flying this type has many advantages, and it is really surprising that nothing has been done along these lines before, although, perhaps,

the reason is to be found in that the view and the range of fire must be thereby restricted. That it now has been taken up again, even if it is by the Germans, is another proof, if such were needed, of how far ahead of his time was Mr. Roe in those early days. First with the tractor biplane, first with the efficient low-powered triplane, first with the enclosed monoplane and biplane, all three forms that are now coming into their own. However, to return to the *Roland*, the wings are of short span—some 30 ft.—whilst there is only one strut on each side, which is made up of three-ply wood and has, in addition to its action as a strut, the function usually assigned to the incidence wires. Inside the large body, which is of elliptical section, are the two seats arranged in tandem, the gunner occupying the rear one. In the neighbourhood of the occupants' seats are a number of windows in the *fuselage* through which pilot and observer obtain their view and through which the machine-gun is fired. The engine used is a 160 h.p. *Mercedes*, and the machine is credited with the following performance: 500 metres in 4 minutes, 1,000 metres in 8 minutes, 1,500 metres in 14 minutes and 2,000 metres in 22 minutes.

The *Halberstadt biplane*, of which we published an illustration some little while ago, has two pairs of struts on each side in spite of its short span, about 28 ft., and is driven by a 120 h.p. *Argus* motor. The *fuselage* is of the *Albatros* type, i.e., built without internal cross-bracing, the necessary rigidity being obtained by covering it with three-ply.

Another machine which is coming into evidence is a small *Albatros* single-seater scout, which has been nicknamed the "German spad." This machine has little resemblance to the standard *Albatros* biplanes as we know them. The span is only about 27 ft., and there is only one pair of struts on each side. Needless to say, the engine is a large water-cooled stationary motor, but what make is fitted as standard is a little uncertain. Both planes are of nearly the same span, and there is no dihedral angle. The *fuselage* is of the *monocoque* type, or, more correctly speaking, it is of rectangular section as regards its main structure, the flat sides and top being streamlined with formers and stringers. The tail plane is rounded as in all the later type *Albatros* biplanes, and the rudder is slightly ahead of the elevator.





### Casualties.

Lieutenant EYON GEORGE ARTHUR BOWEN, Royal Garrison Artillery, attached R.F.C. (posted as missing, now reported killed), was born in August, 1893, and passed out of Woolwich into the Royal Artillery in December, 1913. He had promotion in June of last year, and in May of this year he was appointed Flying Officer in the R.F.C.

Lieutenant R. R. GASKELL, R.F.C., whose death is reported, was the only son of Mr. and Mrs. P. Gaskell, of Newland Park, Hull. He joined the Colours in September, 1914, and was made Second Lieutenant in the Royal Engineers, and served in France six months with Colonel Newell's battalion. He afterwards joined the R.F.C., and was Flying Observer for eight months in France. He was flying for his pilot's certificate when the fatal accident happened.

Lieutenant IVAN HEALD, Royal Naval Division, attached R.F.C., killed in action on December 4th, was a nephew of Mr. John Shackleton, one of the first directors of the North of Ireland Paper Mills, and of Mr. A. Ross, Ballyclare.

Lieutenant ARTHUR GOULBURN BROOKE, R.F.C., who was accidentally killed on December 10th, was the youngest son of Mr. J. M. Brooke, of Childerley Hall, Cambridgeshire, chairman of the Chesterton Board of Guardians. He was born in 1892, and was educated at Chigwell School, Essex, and at the Leys School, Cambridge. Five years ago he went to Canada, but returned on the outbreak of war and enlisted in the Northants Yeomanry. After serving in the trenches in France for more than a year, he joined the R.F.C., and obtained his commission in March last. His only surviving brother, Lieutenant B. Brooke, has been at the front almost continuously since the outbreak of the war.

### Wounded.

Captain EUSTACE OSBORNE GRENFELL, M.C., Royal Garrison Artillery and R.F.C., wounded, was born in 1890, and after having served for a little over a year in the Territorial Force, got a Lieutenancy in the Royal Artillery in August, 1915. On the same date he went into the R.F.C., and for some time this year was Instructor at the Royal Central Flying School. He got his Captaincy in September last year.

### Married and to be Married.

The engagement is announced of Flight-Lieutenant EGBERT CADBURY, R.N.A.S., to Miss MARY FORBES PHILLIPS, daughter of the Rev. C. Forbes Phillips, Vicar of Gorleston, and well known as a writer of plays. Lieutenant Cadbury was awarded the Distinguished Service Cross for his successful attack on a Zeppelin in the last raid on November 28th. He is 23 years of age, and is the youngest son of Mr. George Cadbury, head of the firm of Cadbury Brothers (Ltd.), of Bournville, Birmingham. Miss Forbes

Phillips has frequently appeared in her father's plays, and has written many poems and short stories.

A marriage has been arranged between Commander CLEMENT RICHARD DANE, R.N. (Wing Commander, R.N.A.S.), eldest son of Sir Louis W. Dane, G.C.I.E., C.S.I., I.C.S. (retired), late Lieutenant-Governor, Punjab, India, and Lady Dane, of King's House, Lyndhurst, New Forest, Hants, and BESSIE ALBINIA, only daughter of Dr. and Mrs. T. SANDBY COOMBE, of St. Werburgh Lodge, Hoo, North Kent.

An engagement is announced between Captain C. W. W. DARWIN, Coldstream Guards and R.F.C., eldest son of Colonel and Mrs. Charles Darwin, Elston Hall, Newark, and Dryburn, Durham, and SIBYL, youngest daughter of Mr. and Mrs. CHARLES MARSTON ROSE, of 22, Hans Place, London.

The marriage arranged between H. M. GOODE, R.F.C., and KATHLEEN NOEL BANKS, daughter of Mrs. ARCHIBALD MARSHALL, will take place at Chateau d'Oex on December 28th.

The marriage of MR. CLAUDE GRAHAM-WHITE, to Miss ETHEL LEVEY, the *revue* actress, took place on December 21st at the St. Marylebone Register Office.

A marriage is arranged, and will shortly take place, between Captain HUGH HOLDEN, R.A., only son of Sir Capel Holden, C.B., and Lady Holden, and MARGARET, eldest daughter of the late JOHN WYNDHAM and Mrs. KNIGHT BRUCE, of The Sanctuary, Crediton.

Lieut. FRANCIS GODFREY BAYLIE REYNOLDS, R.F.C., only son of Mr. and Mrs. B. L. Reynolds, of Overleigh, High Wycombe, was on December 14th, at St. Martin's-in-the-Fields Church, Trafalgar Square, married to DORIS, youngest daughter of Mr. and Mrs. R. LONGMAN, of The Lodge, Rectory Avenue, High Wycombe.

### Items.

The Admiralty have sent the following message to Mr. C. E. R. Stevens, of Jersey, concerning his son, previously reported missing, Flight Sub-Lieutenant ALICK C. STEVENS, R.N.V.R.:—"Beg to inform you German official report states that two airmen taken prisoners from damaged English aeroplane at mouth of Thames by German submarine. This presumably refers to your son. Inquiry is being made, and any further information received will be immediately communicated." This probably refers to the Berlin report on December 2nd that a German submarine, finding a damaged British aeroplane near the mouth of the Thames, made prisoners of the occupants, two British coffiers.

The will of the late Captain BASIL HALLAM RADFORD, Kite Balloon Section, R.F.C., of Park Crescent, Portland Place, W., better known to theatre-goers as Basil Hallam, the original Gilbert the Filbert, who was killed near Albert on August 20th, through his balloon breaking away and his parachute failing to open, has been proved at £556.

## AIRCRAFT WORK AT THE FRONT.

### OFFICIAL INFORMATION.

#### British.

War Office, December 20th.

"East Africa.—Our aeroplanes have carried out bombing raids with considerable success, and inflicted appreciable casualties. Rain is falling heavily."

General Headquarters, December 21st, 10.20 p.m.

"The improvement in the weather yesterday led to considerable activity in the air. In the course of the raids carried out by our machines a ton of explosives was dropped on points of military importance behind the enemy's lines. Much fighting took place in the air. One enemy machine was destroyed and six others were driven down damaged. Four of our machines are missing."

War Office, December 21st.

"Mesopotamia.—During the night of the 17th-18th British

aeroplanes successfully bombed the enemy's river craft west of Kut-el-Amara.

#### French.

Paris, December 19th.

"On Sunday night two German aeroplanes were brought down by our pilots on the Verdun front. One of the enemy machines fell on the Herbebois, the other came crashing to the ground near Ornes. Last night our bombardment squadrons dropped 600 kilogrammes (nearly 12 cwt.) of explosives on the railway stations of Dun-sur-Meuse and Montmedy and on bivouacs near Azannes."

Paris, December 21st.

"On the Somme front four enemy aeroplanes have been brought down by our pilots, the first near Manancourt, the second in our lines in the neighbourhood of Clery, the third

400 metres from Devise, and the fourth south of Rouy-le-Grand. This last one was brought down by Sub-Lieut. Nungesser, which brings the number of enemy machines brought down by this pilot to 21. One of our pilots, chasing a German aeroplane, collided with his enemy. The two machines crashed to the ground.

"Yesterday 48 bombs were dropped on the station of Anizy. During yesterday evening four of our machines dropped 480 kiloms. of bombs on the railway stations of Briulles-sur-Meuse and Charleville-Mezieres. Between 5.15 and 6.40 eleven of our aeroplanes set out to drop 47 bombs of 120 mm. on the station and the barracks of Nesles, on the bivouacs and also on convoys which were on the march."

**Russian.** *Petrograd, December 20th.*

"Black Sea.—On December 16th an enemy seaplane, escorted by a destroyer, dropped bombs, without result, on Sulina. The seaplane was hit by our aviator Ragozini, and fell into the sea, but owing to the rough weather we were unable to capture it."

**Italian.** *Rome, December 19th.*

"Hostile aircraft dropped bombs in the Upper Cordevole Valley and on Auronzo, where one of our hospitals was hit. Some people were wounded. The damage is slight."

*Rome, December 21st.*

"Yesterday along the whole front, the weather being fine, artillery and aircraft were more active. On the Trentino front . . . enemy aircraft attempted raids over our lines, but were in all cases driven off by the fire of anti-aircraft batteries."

"On the Julian front . . . our aeroplanes bombed the railway station of Dorimberga (Dornberg), in the Frigido (Vippach) Valley, and the rear of the enemy lines on the Carso. Notwithstanding the fire of numerous batteries all our machines returned safely."

**German.** *Berlin, December 18th.*

"German seaplanes yesterday dropped bombs on the Russian naval forces in the harbour of Sulina (on the Dobrudja coast at one of the mouths of the Danube) and brought down a hostile seaplane by machine-gun fire."

*Berlin, December 21st.*

"In a number of air-fights and as a result of our anti-aircraft fire the enemy lost six aeroplanes in the Somme region."

## SIDE-WINDS.

STRAFE the war once again by way of a finish to the year, with an additional strafe thrown in by reason of its being the cause of stopping these very pleasant little reminders of Christmas which emanate from the Coan Aluminium Castings Depot, Goswell Road way. Last year it was the same, but the good will is there just the same, so we're not going to sorrow after our particular bit of aluminium, but rather hope it carries with it, whatever form it happens to take, the accounting for a Hun or two. So here's a reciprocal greeting, in something round about 50 per cent. under, to

friend Robert W. Coan, to his wishes for "A Happier and Brighter New Year" and that "next year will bring along the dear old peaceful times of happiness we used to enjoy."

THE Clarendon Restaurant, Hammersmith Broadway, was the scene on December 21st of a very successful gathering of between 200 and 250 of the men and women employees of the Davidson Aviation Co., Ltd., Hammersmith, for their First Annual Works Dinner. Mr. P. L. Mott, who has recently joined the Directorate, occupied the chair, supported by His Worship the Mayor of Hammersmith and Mr. W. E. Chester, the Managing Director. After the usual loyal toast, Mr. W. E. Chester, in proposing the health of the Chairman, stated that Mr. Mott had such confidence as regards the future of the Davidson Co., that he had given up a successful business in the City to join the Board, and they all felt it a considerable honour that he had done so. Originally commencing with about 24 employees, the firm now had a staff of workers numbering something like 500, which was sufficient evidence that the work turned out gave complete satisfaction in the right quarter. Their motto was, however, to go forward, and he hoped that this first gathering was only the forerunner of many such meetings in the future, when he hoped to see the number present tripled or quadrupled. The Mayor, replying for "The Visitors," said Hammersmith was proud to have some of the most successful businesses of the country in their midst, and from what he saw and from what he had heard from the Managing Director, he felt sure that success was assured to the Davidson Aviation Co. On behalf of the Borough, he wished the Company every success and good wish. A splendid musical programme had been arranged, but owing to its length and the appreciation of the turns it had to be considerably curtailed.

## FLIGHT.

44, ST. MARTIN'S LANE, LONDON, W.C.  
Telegraphic address: Truditur, London.  
Telephone: 1828 Gerrard.

### SUBSCRIPTION RATES.

"FLIGHT" will be forwarded, post free, at the following rates:—

UNITED KINGDOM.			ABROAD.		
	s.	d.		s.	d.
3 Months, Post Free..	1	8	3 Months, Post Free	2	9
6 " " " " " "	3	3	6 " " " " " "	5	6
12 " " " " " "	6	6	12 " " " " " "	11	0

Cheques and Post Office Orders should be made payable to the Proprietors of "FLIGHT," 44, St. Martin's Lane, W.C., and crossed London County and Westminster Bank, otherwise no responsibility will be accepted.

Should any difficulty be experienced in procuring "FLIGHT" from local newsvendors, intending readers can obtain each issue direct from the Publishing Office, by forwarding remittance as above.

